THE
TROPICAL AGRICULTURIST
MONTHLY.

Vol. X. COLOMBO, MARCH 2ND, 1891. [No 9.

THE CULTIVATION, MANUFACTURE AND CHEMISTRY OF TEA.

SOME very valuable information on these heads will be found in the report of Mr. Bramber which is given in the proceedings of the Horticultural Society of India on page 616. As a preliminary to his detailed and exhaustive analyses of the tea bush, soils, manures, &c., the chemist employed by the Horticultural Society and the planters has commenced visiting the various tea districts, and the report we are to extract contains a record of the impressions produced by the first of those visits. With reference to recent discussions on forking, it will be seen that Mr. Bramber attaches much importance to frequent and deep hoeing of the soil so that air and moisture may be admitted for the decomposition of micaceous and other rocks containing potash. Very close planting is objected to because of the obstacle to hoeing presented by the interlaced roots, such interlacing also rendering the bushes more liable to attacks of blight. All planters will agree that when plants are diseased, whether suffering from insect or fungus pests, the prunings ought, as Mr. Bramber suggests to be burned and the ashes (with all ashes from the factory and lines), carefully applied as manure. But we submit that the prunings from healthy plants can be better utilized if buried unburnt. Our experience is that neither decomposing prunings nor rotting tree-stumps do any harm to, but rather benefit, tea bushes, with one notable exception in the case of a very beautiful but very fatal *symplocos*. On the decaying tuberous roots of this special tree, a poisonous fungus forms, which, when it comes in contact with the roots of the tea bushes, is speedily and inevitably fatal, gaps arising from the destruction of three or four to a dozen tea bushes, being scattered over estates, where stumps of this upas-like tree have been left to decay in the ground, instead of being carefully removed and burnt, as they ought to be. What Mr. Bramber says about plants left to grow in old nurseries is in accordance with all experience, and what is said of the loss of nitrogen by the periodical firing of grass lands is worthy of attention. Whether for improved pasturage or cultivation with tea or other plants, our patanas would be enormously benefitted by the application of nitrogenous manures. The pity is that such substances are so costly, the disturbed condition of the American sources of supply tending to make them still more so. Droppings in caves haunted by bats and swiftlets would be valuable, but we believe the Sinhalese rice cultivators appreciate and use this matter largely. The question is whether grass lands might not be enormously improved by the growing and burial in them of several successive crops of leguminous plants, such as the lupins, common peas, &c. Clover might also be tried, as its roots go far down into and improve the soil, in which it will grow. Mr. Bramber's notice of the heat produced in tea leaves by the friction of the roller, and the subsequent rapid cooling down from evaporation in the "fermenting" process, are suggestive of important and beneficial results, likely to be attained from further research in this direction. We shall look with keen interest for further reports of the comprehensive experiments which Mr. Bramber is to institute.

SALE OF VALUABLE ESTATE PROPERTY.

The estate of Holyrood West in Dimbula, consisting of 546 acres of which 350 are planted with tea and 150 acres still in good coffee, has just been sold by Mr. G. S. Duff to the Ceylon Plantations Tea Company for £15,000 sterling. The Company is to be congratulated on acquiring so valuable a property which apart from its intrinsic value, has a railway station at each end of the estate—Watagoda and Talawakele. Mr. Talbot has now in charge for this Company a series of as valuable properties as have ever been owned by a plantation Association in Ceylon.

OPERATIONS FOR GEMMING IN CEYLON.

The capital which was conditionally underwritten should the preliminary work by the Syndicate prove satisfactory was, to the best of my remembrance, £250,000, or even £300,000. All hope of the underwriters carrying out such an engagement must now, it is certain, be abandoned. This class of speculators have, as you have before been informed by me, been so fearfully hard hit during the last six months, that there is scarcely a penny of available capital among all its members. Fully alive to this fact, Mr. Saunders tells me he and those working with him have quite given up all idea of ultimately proceeding on so grandiose a scale. At length, and for the first time, Mr. Saunders has informed me that Mr. Barrington Brown's report was a hopeful one. That report stated in effect that, while the conditions as regards gemming in Ceylon prevented him from giving full assurance as to ultimate success, he felt the conviction that its undertaking on a considerable scale had a hopeful future before it. He has, since the sending in of that report, furnished estimates for the machinery, &c. necessary for preliminary working on a moderate scale, but the Syndicate, in view of the total impossibility of obtaining any public subscription at present, has determined upon itself commencing work with the £6,000 of its capital as yet uncalled up. In pursuance of that intention, a practical miner is to leave England for Ceylon within the next few weeks, and he will take with him steam pumping machinery adequate for clearing water from mines of a depth of 100 to 150 feet, and will begin operations as soon as that machinery can be erected. This, as I understand, has already been purchased here and is to be shortly shipped for Ceylon. At the same time, one of the plumbago properties owned by the Syndicate is to be simultaneously worked, and should satisfactory results be obtained from both industries, subsidiary companies may be started with a capital of £50,000 each; or failing any prospect of starting these successfully, additional capital for extension of the work will be subscribed by the members of the Syndicate themselves

THE CEYLON (AMERICAN) PLANTERS' TEA COMPANY.

A specimen of one of the paper packages used by this Company for packing their teas has reached us. It is of a very pretty design and intended to hold one pound of tea. The printing is executed in several colours and looks very attractive. The trade mark of the Company (an elephant surrounded by branches of tea) is printed in white on a red ground in the centre on four sides of the box, together with the following inscriptions in suitable type and positions:—

"The Ceylon Planters' Tea Company trading under the auspices of the Planters' Association of Ceylon. The Ceylon Planters' Tea Company, New York City, trading under the auspices of the Planters' Association of Ceylon.

"Budh-Tea of Ceylon, formerly Buddha, altered at the request of the Buddhist Defence Committee of Ceylon.

"INFORMATION:—This Company has been formed by the British tea planters of Ceylon to open up and control the American trade in the teas of Ceylon. They are interested in having their teas sold pure, understood and properly used. They will not allow it to be mixed or tampered with in any way, and this package contains one full pound of Ceylon tea, guaranteed strictly pure and unadulterated. *Our brands* all come from the same bush and differ only in the age of the leaf. They are sorted by sifting and the smaller the leaf the finer the flavour. Buds finest of all.

"GRADES AND PRICES.—Bhud (tea-leaf buds) 1 dollar and 25 cents a pound; this brand has the finest flavour. Tiffin (small leaves) 90 cents a pound; this brand has fine flavour. Bungaloe (large leaves) 65 cents a pound; this brand has good flavour.

"Till you have a local supply we pay freight or expressage. The three are alike, except in age of leaf. All come from the same bush, and the leaves are plucked together. The smaller the leaves the finer the flavour: and yet some prefer Tiffin to Bhud.

"HOW TO MAKE PERFECT TEA.—Use an earthen pot and have it hot to begin with. Use fresh water that has just come to full boiling and has not been boiling so long as a minute. Make tea at table, not in the kitchen. Pour the boiling water into the pot, put the tea in on top of the water, and in from two to seven minutes pour into cups or another tea pot. Do not let the tea stand on the leaves much longer than seven minutes. Use half or a third as much of this tea as of China or Japan tea. How to make it better than usual but not perfect:—Steep it after the old American fashion and use half or a third as much as of China or Japan tea."

Ceylon tea in these packages will no doubt find favour with the American public soon.

SALE OF ESTATES.

Harmony estate in the Pussellawa district, hitherto belonging to Mr. J. Russell Grant, has been purchased by the proprietors of Nayapane for R45,000. It consists of 204 acres of which 115 are in tea.

Rogart and Lang's Land estates in the Kalutara district—proprietors Messrs. F. D. Mitchell and Donald Mackay—have been sold to Mr. Booth, the proprietor of Glendon estate in the same district, for £3,500 sterling. They comprise 779 acres, of which 238 are in tea with some Liberian coffee and cardamoms.

CACAO STEALING ON MAKULUSSE ESTATE, BEREDEWELA.

One Ramasamy kangani of Makulusse esta'e in Beredewela charged a man by the name of Ukkua Kattadia with theft and having the unripe fruit of a cacao tree in his possession, without being able satisfactorily to account for the same the property of Makulusse estate, whose manager is Mr. Tennant of Beredowela. It appears that the complainant noticing a pod that had been very recently pulled off near a tree below the store, took another two coolies along with him and went running along the path which led to the boundary of the estate on the Beredewela village side. He then saw a man with a bag on his shoulder going towards the village. One ran up and caught his head; he then dropped the bag, which contained thirty-five pods worth about R5. When the accused was asked where he got the pods found in the bag he said that while he seized the thief who was carrying it dropped it and ran away.

JUDGMENT.—This is a very clear case, and the defence is as audacious as it is novel. The accused is a very old man about 55 or 56, and I therefore will not sentence him to receive lashes, but he richly deserves them. I cannot help thinking that the accused was not the only thief who had been robbing the Makulusse estate. However, his attempt to go scot-free by throwing the theft on others has entirely failed. I find him guilty and sentence him to undergo rigorous imprisonment for a term of six months. (Signed) J. H. EATON, P. M.

THEFT OF CACAO FROM SUDUGANGA ESTATE.

The superintendent of Suduganga estate, Mr. L. Falkner, charged one Kalimuttu with stealing 22 pods of cacao valued R2·62½, the property of Mr. Hutton. It transpired in evidence that the watcher hearing a rustle amongst the cacao, went with another man to the spot and saw some six or seven men pick-

ing cacao. Seeing them the thieves ran towards a jungle, while one with his handkerchief bundled with cacao pods was seized about a chain's distance from the jungle. He was immediately brought to the head kangani and from thence to the superintendent. On being questioned he said that he stole the cacao upon the instigation of some other men.

JUDGEMENT.—The son of the accused only confess the case of the prosecution: "a party of about six men came to his father last night and took him away saying that the kangani of Suduganga estate wanted him. His father (the accused) did not return home last night, but this morning that lad hears his father had been taken to the estate." That story (if true) tallies with the case for the prosecution. The accused was seen at midnight running away with a party of six or seven men in the direction of a jungle into which five of them escaped and the accused was caught within a chain's distance from the jungle carrying a parcel of about nineteen cacao pods, sixteen of which were unripe. He is taken promptly to Mr. Falkner, the superintendent, and he there makes a clean breast of his guilt. He says he was inveigled into this theft by six others and that he alone was captured. That fact does not exculpate his guilt; it only aggravates it, for it shows that he is willing to unite himself with gang-robbers and help them in their depredations. I cannot under the existing state of law find him guilty under the 2nd section of the Ordinance No. 22 of 1886.—If I thought I could, I should feel certainly called upon in this case to do all I could to suppress the theft of prædial products by inflicting the only punishment which I think is likely to have a deterrent effect upon the village thieves, who live and thrive by thefts on European estates in the neighbourhood, viz., by imposing lashes on the offenders. The possession of the unripe fruit of the coffee or cacao tree, &c. by any person who is unable to give a satisfactory account of his possession thereof is constituted an offence by sec. 2 of Ordinance No. 22 of 1886, and shall on conviction be liable to the punishments provided for the theft of prædial products under section 368 of the Penal Code, and if the case fall within the power of the Police Magistrate to try, he the Magistrate may add lashes not exceeding 20 to the punishment he is autho rized by section 368 to inflict. I may be mistaken in my construction of the section of the Ordinance No. 22 of 1886 I have quoted, but I feel strongly that the power of a Magistrate to inflict lashes is limited to a case where a man is found in the direction of a jungle into which five of them escaped; and the accused was caught within a chain's distance from that jungle carrying a parcel of 19 cacao pods all tied up in a handkerchief. He is taken promptly to Mr. Falkner, the superintendent, and he there makes a clean breast of his guilt. He says he was inveigled into this theft by 6 or 7 others and that he alone had the misfortune to be caught. This fact, instead of extenuating his guilt only aggravates it, for it shows that without any hesitancy or fear of consequences he could readily unite with gang-robbers and help them in their depredations. The value of the cacao found on his person may be very small, but the unchecked prevalence of a crime for which I think only lashes will be a deterrent, demands that I should inflict as severe a penalty as is competent for me to impose. I find the accused guilty and sentence him to undergo rigorous imprisonment for a term of six months.

(Signed) J. H. EATON, P. M.

THEFT OF DRIED CACAO SEED FROM CRYSTAL HILL ESTATE.

Mr. A. G. K. Borron charged one Barakare Gedare Suddara with the theft and removing of about four measures of dried cacao seed worth R1·50. From the evidence it appears that in consequence of the theft of cacao on the estate Mr. Borron put a villager on the watch. This watcher saw the accused going towards the caddies with a bag of cacao for sale. The accused was brought to the store to Mr. Borron, and on being asked from where he got the cacao said that a cooly gave it him. He was asked to point out the man, but pointed one who denied ever having given cacao to the accused.

JUDGMENT.—I find the accused guilty and sentence him to undergo rigorous imprisonment for a period of four months.—(Signed) J. H. EATON, P. M.

THE NEW GUINEA CO. AS PLANTERS.

From the Far East news comes that the S. S. "Ysabel," owned by the New Guinea Company, has arrived at Finchhaven, landing there the Plenipotentiary of the Kaiser Wilhelm Plantagen Gesellschaft (Hamburg), Mr. Kindt. The company intends to cultivate cocoa and coffee, and Mr. Kindt therefore had bought at Ceylon the necessary material, of which about 18,000 young cocoa plants have arrived at Finchhaven in good condition. The cultivation of coffee will be commenced later on. Herr Kindt is accompanied by four Malayan artisans, viz., two carpenters and two smiths, as well as by eighteen Malayan coolies.—*L. and C. Express*, Jan. 2nd.

RAINFALL IN LAXAPANA, MASKELIYA.

Mr. Geo. Greig is good enough to send us a carefully compiled, coloured diagram of rainfall which we shall notice fully hereafter, meantime giving his explanation:—"I enclose a very carefully kept record of the rainfall on this estate during the past 15 years. No doubt it will interest you as you so frequently refer to the heavy falls of rain that take place on Theberton, which in air line cannot be more than 3 miles from this, while we here are much more under the shadow of the great Peak than Theberton is. The falling-off in the last four years to an average of 121·21 against 157·35 on the previous 11 years is rather remarkable—the short-fall having taken place in the south-west months chiefly. At the same time there has been no falling off in the south-west monsoon—rather the reverse in 1890, along its main track between this and Yatiyantota.

MANA GRASS EXPERIMENTS; COLOMBO COMMERCIAL CO., LD.; COFFEE IN UVA; PATENT TEA-ROLLING MACHINE; ASSETS REALIZATION CO.

London, Jan. 9th.

My last letter described to you an interview had by me with one of the partners in the firm of Messrs. Curtis & Harvey on the subject of its proposed utilization of mana grass from Ceylon. It seemed to me to be singular that that firm should have ever conceived the idea of using a charcoal burned from this grass in the manufacture of gunpowder. As the result to my further inquiry made this week, we now know that Messrs. Curtis & Harvey had long experienced a difficulty in obtaining a supply of suitable material. The willow trees which long furnished the best-adapted form of supply, and which in past times fringed the banks of our English streams in such wild luxuriance, have gradually become thinned off that their number has become so wholly inadequate to the modern demand for the main base of gunpowder manufacture. The firm, therefore, had given general instructions to the patent agents to be on the look-out for anything novel coming under their notice which they might think offer a chance of being suitable. Messrs. Jensen, the patent agents of Chancery Lane, heard of the experiments proceeding with the mana grass on behalf of the Stanley-Wrighton Syndicate, and took a specimen of it to Messrs. Curtis & Harvey, who thought that they saw in it a possible alternative material, and consequently gave the order for a ton to be sent to them from Ceylon for the purpose of experimenting with it.

Calling at the offices of the Colombo Commercial Company this week to see if the report now about due could be obtained, it was told me that it would not be ready before the end of the present month, but that it might be expected to be of a not unsatisfactory character. The Uva and Spring Valley Companies, as you know, share the offices of the abovementioned Company, and Mr. Roberts told me that the directors of these had determined upon paying an interim dividend of three per cent in both cases, payment of this being due on the 12th of this month.

Conversing with the last-mentioned gentleman, the subject was introduced of the success reported in our last received *Overland Observer* of some of the land in Ceylon lately planted out with coffee plants from Mysore. Mr. Roberts, in reply to my questioning, said that although their coffee in Uva was doing pretty well, the results were nothing magnificent, the trees still suffering much from their insect pests. He further said he did not think it unlikely that new blood introduced, and planted well away from old infected coffee, might do well. "At all events," he remarked, " it is quite certain that no idea is at the present time entertained of rooting up coffee on our Uva estates for the purpose of planting tea. "I can't tell you, he continued," whether our directors may think it worth their while to replace exhausted trees with others obtained from India, for I have never heard the subject discussed. Mr. Brown is out in Ceylon now, and he will doubtless be able to judge whether the experiments reported by the *Observer* have had such a measure of success as to induce him to make such an alteration on our estates as you have suggested. It occurs to me personally, that, although the course mentioned might be successful on a new clearing away from proximate bad influences, it might not prove to be so in the case of isolated plants put down among coffee trees which have been infected and infested for years past.

The mention of Mr. Brown's name reminds me that it has been told to me this week that one of his patent tea-rolling machines is to be put up and worked for exhibition in some public part of the city very shortly, and this form of advertisement being now very popular and very successful, it may be expected that orders for these useful machines will be greatly stimulated. But we hear that such stimulation is not as yet much needed, for Messrs. Abernethy of Aberdeen, the manufacturers of the machines, have orders booked very much in advance of their power of immediate production. A modification introduced by Mr. Brown since his earlier machines were made is said to have given particularly valuable results. In the first instance the lid of the rolling casing was fixed. This is now made to revolve, and—as far as I can understand—at a speed differentiating with that of the rollers. This, combined with the use of brass liners instead of wood and a slightly increased spacing, is said to have completely stopped any tendency to throw the leaf out, while at the same time it keeps the tea under treatment far cooler than under the first arrangement adopted. —London *Cor.*

CINCHONA IN THE DUTCH MARKET.

Amsterdam, Jan. 7th.

CINCHONA BARK.—At the sales to be held in Amsterdam on January 22nd, 2,332 bales and 238 cases (about 215 tons) will be offered, divided as follows:—Java bark, from Government plantations, 252 bales, 39 cases, about 23 tons; from private plantations, 2,00 bales 199 cases, about 192 tons, of which are: *Druggist's Bark:* Succirubra quills 172 cases, broken quills and chips 113 bales, 18 cases; root 60 bales; C. Schuhkrafft quills, 6 cases Lancifolia quills, 4 cases; broken quills and chips, 5 cases. *Manufacturing Bark:* Ledgeriana, broken quills and chips, 1,430 bales, 22 cases; root, 360 bales: Hybrids, quills, 11 cases; broken quills and chips, 281 cases; root, 88 bales. Total, 2,332 bales, 238 cases.

The January sales are comparatively small ones, because several parcels destined for that auction could not be warehoused timely enough, owing to our canals being closed by ice. Most probably the next sales—on February 25th—will be so much the larger—say at least 4,000 packages.—*Chemist and Druggist*, Jan. 10th.

WIND POWER.

DEEP WELL PUMPS.—It is remarkable to find water close to the surface in the alluvial soil in Vere in sufficient quantities to give a continual flow from pumps worked by windmills. It appears to me that, though there is not sufficient water at a depth of 30 feet for the purpose of irrigation, an increasing quantity would probably be found at lower depths and even enough to supply the large quantity necessary for irrigation. A series of tube wells driven at intervals with deep-well pumps attached might bring up a flow large enough for irrigation. The immense value of irrigation is evident to anyone who sees the parched look of the canes this year after the continuous drought, and knows what the land will produce with good seasons. At any rate the experiment of a deep well pump would be worth making.

[The above from the *Jamaica Botanical Bulletin* shews that wind power is commonly employed in the western island to raise water. Why is it not more utilized here? A wind-mill has been a success at Galle.—ED. *T. A.*]

ANALYSIS OF TEA SOILS, MANURES, &c.

The following letter was received from Mr. Bambor after his first visit to the Tea Districts:—

"Having returned from a visit of inspection of some of the tea gardens in the Dooars, I now give you an outline of my observations and inquiries.

"The chief gardens visited were Sissobare, Matilli. Chulsa and Hope with others in the neighbourhood, and I have to thank the managers of the various gardens for their kindness and hospitality, and also for their willingness to afford me any information and assistance I required.

"The soil of the district varies a good deal, that of the higher land being of a redder colour and slightly heavier than that of the lower with land, which is generally of a light open texture, varying considerably in depth, and with a subsoil full of boulders and pebbles. Both soils have, however, been formed by the decomposition of the older rocks, and contain a large amount of micaceous sand, the decomposition of which, if it was not so slow, would yield a sufficient quantity of potash for the use of the tea plant. This however could be hastened by deeper and more frequent hoeing, which would enable the air to act more freely upon it, rendering it soluble and therefore in a condition in which the plan could make use of it.

"Although the soil of the lower lands is so open drainage is found to be absolutely necessary for the healthy growth of the plant, owing to the flatness of the country. If this is not done, the heavy rainfall causes the soil to become waterlogged, which stops root growth, and the plant naturally sickens and yields a smaller quantity of leaf.

"In the older gardens, the plants (a mixture of China and hybrid) have been found to be planted too closely, being in some instances only 2′ to 3′ apart, and this has caused a slower growth, owing to the small amount of feeding and breathing room allowed for each plant; it also appears to make them more subject to blight, as these bushes suffer more than those planted at wider intervals. Another disadvantage of this close planting is that the surface roots interlace with each other, so that deep cultivation is impossible without injury to the plants and therefore the air does not penetrate so deeply into the soil.

"I have suggested the burning of all prunings, especially all blighted leaves and large wood, as it is probable that hoeing in the former, unburnt, is one of the chief causes of the continuance of the disease, and if every manager would see that this is thoroughly done every pruning season, the serious ravages of this disease should be considerably lessened. The larger branches, also, if allowed to slowly decompose in the soil, form a suitable home for many insects and fungi, which may injure the growing plants. That decomposing would has an injurious effect on the plant is plainly seen where bushes are placed near a dead stump.* As a rule, they flourish for a time until their roots reach those of the decaying stump, when the leaves suddenly wither up and the plant dies. It is also very important that the ash obtained from the prunings should be restored to the plants, otherwise considerable loss to the soil would ensue. Besides it is the best possible manure for the plants, as it contains all the necessary mineral constituents in an easily available condition.

"Another important source of manure is the ash of the wood burnt in the engines; the ash from which is rarely made use of, being usually merely thrown out in heaps and exposed to all weathers, causing a loss of valuable plant food; whereas if it was placed under cover to protect it from the rain until a sufficient quantity for application was collected, a cheap and effective manure would be always available. Its good effect on the tea plant was well marked in one instance where it had been thrown among some bushes growing close to the engine house, these being of a healthy dark green colour, and nearly a foot higher than the surrounding bushes.

"The soil of the new extensions, which had previously been covered with jungle, is more suitable for the tea plant than broken-up grass land, no doubt due to the larger amount of organic and easily soluble mineral matter present in the surface soil in the former, and also to the burning or removal of the grass which causes an annual loss of organic matter and nitrogen, so that probably the application of a nitrogenous manure to this soil would be of great benefit.

"The site of the old nurseries is plainly marked in the old and new gardens, by smaller plants of feeble growth; this is no doubt owing to the large amount of surface soil removed with young plants, and consequently most of the readily available plant food, so that to these places either soil from the jungles near by, or some complete manure, should be applied to restore them to their former condition.

"There was only one point called for attention in the manufactory, which was, that in some cases the leaf was sifted after the first rolling, so as to separate the coarser from the finer leaves, by which means a more even fermentation is secured and a better sample of tea obtained.

"In noting the temperature of leaf during the fermentation I found that there was a gradual lowering for about two-thirds of the time, after which it remained constant at a temperature below that of the surrounding atmosphere. The high temperature of the leaf at first was due to friction in the rolling, and the rapid cooling to evaporation of moisture from the damp cloths covering the leaf. The following were the temperatures noted for fine and coarse leaves, taken at intervals of half-an-hour:—

Fine leaf ..77·9°, 74·3°, 73·7°, 72·6° F.
Coarse leaf ..74·6°, 72·4°, 71·6°, 70·2° F.

"However no definite conclusions can yet be arrived at as to the best temperature for the fermentation, as probably in the rainy and hot season, a different one would give as good or better results, and further trials will be made at that time when an opportunity occurs for again visiting the districts.—I remain, yours faithfully, (Sd) M. K. BAMBER.

* See *Proceedings*, March and May, 1887.

It is proposed that Mr. Bamber should have an opportunity of seeing the districts of Assam and Cachar &c., before settling down to the analyses of soil. During his tour through these districts he will collect samples of soils and plants to be analysed, and organize all arrangements for manural experiments.—*Agricultural and Horticultural Society of India.*

GROCERIES AND THE AMERICAN TARIFF.

One day last week a reporter of the *Public Ledger* of Philadelphia, dropped into the store of Finley Acker & Co., and was fortunate in meeting the unusually shrewd and level-headed senior member of the firm, who spoke as follows regarding the effect of the tariff on the prices of groceries:—

"Ever since the passage of the bill in nearly all branches of trade the cry has been heard: 'Higher prices! Higher prices!' So general and familiar has become the cry that when a young lady was facetiously asked to pay five cents for a two-cent stamp which she had ordered she gravely paid the amount without a murmur, attributing the advance to the operations of the McKinley bill.* * *

OTHER CAUSES OPERATING.

"Have any other causes operated to advance the prices of goods in your line?" asked the reporter.

"Yes, there is tea. On account of the rapid advance in the price of silver several months ago, teas advanced considerably in price, but are now back again to their former value. Although our trade has been rapidly growing, we think that tea should be used much more freely than it is. When we consider that a pound of tea will make nearly 300 cups, while a pound of coffee makes but 32 cups, we can readily see how economical tea is in comparison with coffee, even if the highest priced tea be used.

"The cost of coffees have still further advanced, but not to an extent sufficient to affect retail prices. We are hoping that in time we will again be able to sell coffee at the very low and popular prices of several years ago.

"While speaking of beverages we must refer to the development of the cocoa trade within the last year or two," continued Mr. Acker. "It has been almost phenomenal. Instead of cocoa being used on rare occasions, or in the sick rooms, it is now in daily consumption in many families. One reason for this is that more enterprise has been shown by cocoa manufacturers in popularizing this nutritious beverage, and demonstrating its cheapness as compared with coffee. One pound of cocoa is said to make from 60 to 80 cups, and when you can buy it at 40c a pound you can readily see how cheap it is. Even if you buy it at $1 a pound it will still be as cheap as coffee.—*American Grocer.*

"A CEYLON TEA-SELLING COMPANY, LIMITED.

UNDER THE PATRONAGE OF THE CEYLON PLANTERS' ASSOCIATION."

Such is the important decision arrived at by the representatives of the Ceylon Tea planters assembled in the Tea Fund Committee—namely, to take steps for the formation of a Limited Company to undertake the business of selling pure Ceylon teas, in new lands especially. The immediate cause of this movement has been the enquiry through the Imperial Bank of Russia on behalf of constituents as to the financial standing of the Planters' Association of Ceylon—made, evidently under the impression that the Association was a business Company of planters ready to sell their tea direct. There can be no doubt that there is room for such a Company as that now proposed, and that if managed judiciously on business principles, it ought to be specially successful in giving

handsome dividends to its shareholders. A further reason for such a Company is the need of affording even in the old country, a thorough guarantee to consumers and country dealers of the purity of the tea they drink, and of endeavouring to fight the battle of Ceylon tea against advertisers—large firms and even many who are pretended friends of Ceylon—who are really great enemies of our teas. The mischief for instance done by one of the largest dealers in tea in the United Kingdom who has a direct connection with Ceylon—and yet who goes on selling teas at 1s to 1s 3d per lb. giving the impression to many from the way Ceylon is referred to in his advertisements that these are pure Ceylon teas, must be very great. Another enemy of our teas has been brought to light through a circular issued by Messrs. Stuart Cranston & Co. of Glasgow who have the audacity to pretend to expose fraudulent dealers and in doing so, to make the following most false and libellous statements as regards Ceylon teas :—

"The ladies of Glasgow appear to act differently, for they continue to flock in crowds to these several unscrupulous dealers who have perverted and vitiated the public taste, and amassed fortunes in the act, by supplying strong, dark, bitter Indian and Ceylon teas, which are full of tannin, to the exclusion of the mild, pale, liquoring and finely flavored China Tea, from which the bulk of the tannin has been eliminated in the process of 'rolling'?

"Something akin to this is perpetrated by the Indian and Ceylon planters, because they retain all the tannin, while the Chinese (who are still the masters in the art of tea-making) discard tannin as a waste product. This is the one radical difference in the two systems, and explains why the Indian and Ceylon yield 9 per cent of tannin, while China tea yields only 3 per cent. The most remarkable fact is that all three yield the same amount of Theine.

We have Professor Dittmar's permission to quote his words, that 'on the question of quality and flavour a chemist can say nothing, and only a practical tea-taster can speak with authority.' Thus armed, we do assert that no Indian or Ceylon tea possesses quality and flavour equal to China tea compared price for price, at 1/5 per lb. and upwards.

"NOTE.—This statement may be qualified so as to except a few of the choice mild, fine flavoured Darjeelings and Ceylons such as we buy."

The Ceylon Planters' Tea Co. Ld., must make its business to controvert such incorrect and mischievous business notices and those of other large dealers who profess to sell good first-class teas at little over a shilling, by making known the true state of the case.

TEA ESTATE PROPERTY IN CEYLON.

There have been some big sales of property since our last, notably that of Holyrood West estate belonging to Mr. G. S. Duff with 500 acres of fine tea and coffee for £15,000 or at the rate of £30 sterling per acre. In addition, it is reported, Mr. Duff gets some £1,200 profit from the half-year's working, so that the price is a good one; but the property is very valuable to the Ceylon Tea Plantations Company who own Holyrood East with nearly 500 more acres of tea—so that there will be a 1,000 acres in a stretch in one of the finest parts of Dimbula with a railway station at each end.

By way of contrast however, we have a sale in the Kalutara district—also effected in England—which if not explained is certain to reflect on the value of property, in that district. News has come out from home that the "estates" of "Rogart" and "Lang's Land" for £3,500 sterling. Now, these two places are entered as belonging to Messrs. F. D. Mitchell and D. Mackay—the Ceylon Tea Plantations Co. being agents—and stand in our last Directory as follows :—

Rogart—185 acres tea; 15 Liberian coffee; 20 cardamoms; 176 acres reserve.

Lang's Land 50 tea; 333 reserve.

Most of the tea must be in bearing, and therefore that over 200 acres of our new product besides over 500 acres reserve (most of it big forest) should have sold for £3,500 is what no person at this end seems able to explain. It seems pretty certain that if locally advertised freely and sold separately or cut even into 3 or 4 lots, these properties should have sold for much more.—Meantime the fortunate new proprietor is Mr. Booth of Glendon estate adjoining; and the purchase seems, as we have said, to have been effected in London.

EXPORTS AND FREIGHT FROM CEYLON.

The following table for which we are indebted to a mercantile friend is of considerable interest. It has been compiled with a view to show that although the number of vessels which take cargo from Ceylon steadily increase, yet the quantity of cargo available increases in proportion—if indeed the increase in the latter is not more marked. In any case, it is quite evident tea cargo alone from Colombo is going on increasing at such a rate, that we shall be very glad for freight reasons alone, to see the Russian Volunteer fleet coming to this port to load tea direct from Odessa. The table is as follows :—

Abstract of EXPORTS of CEYLON PRODUCE in 1888, 1889 and 1890 reduced to Shipping Tons Ceylon scale.

Produce.	1888.	1889.	1890.	1890. Inc,	Dec.	Scale per ton.
Coffee ...	9,976	6,291	6,107		184	14cwt. in casks, 16 cwt. in bags,
Cinchona ...	7,255	5,304	4,987		317	1750 the average pressed into 50 c. f.
Tea ...	24,331	34,048	46,901	12,853		1,000 lb. averages 50 c. f.
Cocoa ...	939	1,361	1,141			14 cwt.
Cardamons	287	361	387	26		1,000 lb. averages 50 c. f.
Cinnamon.	1,996	2,377	2,129		248	1,200 lb. in bales and 800 lb. in bags.
Coconut Oil	22,935	22,286	22,668	382		169 average.
Copra ...	11,548	3,198	10,791	7,593		12 cwt.
Poonac ...	5,159	6,811	7,254	443		20 cwt.
Coconuts ...	5,197	5,004	11,907	6,903		per mille.
Plumbago, .	11,276	23,775	19,287		4,468	20 cwt.
Coir Goods.	16,536	18,481	19,671	1,190		Rope 8 cwt. yarn, and fibre 6 cwt.
Ebony ...	608	178	468	290		20 cwt.
Horns ...	152	123	143	20		16 cwt.
Sapan wood	137	54	62	8		20 cwt.
Orchilla weed ...	40	45	25		20	12 cwt.
Kitool Fibre ...	298	491	399		92	6 cwt.
Citronella Oil ...	1,689	1,642	1,819	177		8,000 oz. averages 50 c. f
C'mon Oil	22	19	13	6	6	8,000 oz. " 50 c. f.
Total...	120,431	131,849	15,6159	29,885	5,575	tons Ceylon scale,
Net inc'ase 1890...		24,310			24,310	
		156,159	15,6159		29,885	

Vessels cleared outwards from Ceylon with cargo (1888) 573; (1889) 611; (1890) 698.

1888, 573 vessels' and 120,431 tons cargo=210 tons per vessel.
1889, 611 " " 131,849 " " =215 " "
1890, 698 " " 156,159 " " =223 " "
net increase = 8 " " in 1890

CEYLON UPCOUNTRY PLANTING REPORT.

CACAO: LOSS IN WEIGHT; THE "SUBMERGED TENTH" AND "NATURAL DRIAGE"—WEATHER—COOLIES.

Jan. 26th.

The cacao crop is drawing to a close; and while some have reason to regret that it has not been quite so good as they expected, others have done better and rejoice accordingly. There is no denying that many who went in at the first rush for this product were sadly disappointed. Here and there, all over the planting districts, there still remain evidences of that outburst of enthusiasm in the shape of isolated cacao trees—deplorably ragged looking things which would be enough to scare anyone from renewed efforts. They stand there as warnings and awful examples, and are pointed to as conclusive when a good word is said for a first trial. But about cacao we have learned much and are still learning, and I am of opinion that if, when there was a general run into cacao, the knowledge of its ways and wants had been at all abreast of what we possess today, there would not have been that shrinkage of cultivated area which we deplore, nor the current belief, which is pretty strong amongst us that only in highly favoured spots can this profitable cultivation be carried on.

Cacao is not a hardy thing like tea, but is a plant demanding much patient care; and it may be because this care had to continue unrelaxed for so long a time that we have in our midst those who scout at it, and question its profitable nature. Men who are in possession of good cacao gardens know whether the thing pays or not, and the sort of feeling among them as far as I can discover is that of an inclination of laughing in their sleeve, and satisfaction that cacao should be decried. The more it is proved on paper that the industry cannot pay, the more they like it.

The grower of cacao is, however, not without his bothers. If he has a fair field to fight these bothers in, it only adds a little zest to life; but when he feels that he is running his head against a stone wall, it is different. We can fight the borer, the porcupine, the want of shade, the cutting effects of wind, and to some extent the raid of the Sinhalese rogue; but loss of weight in London is as hard a nut to crack as the problem of the poor, and, like that unfortunate class is always with us. Cacao shipments, however accurately they are weighed on this side, invariably come out short. There is a "submerged tenth" over and above the regular allowances which goes astray in the modern Babylon, and, alas! is never reclaimed. I fancy that all cacao shippers have had, at some time or another a tussle with their home correspondents over loss in weight, and have found that "mickle din and little oo" &c. accurately describes all that was ever gained when time was called. You may enter gaily into the controversy, but you come out with a chastened spirit. One who had gone through this valley of humiliation when I made up my mind to tread its tortuous way gave me this as his painful record:—"I have gone through all the performance of correspondence, and of sheer humanity charge you to desist. You will gain nothing, and the advantages of a cool climate are so completely in the brokers' favour that wisdom dictates a moderate course." Are these the words of wisdom or pusillanimity? Let each judge for himself. I certainly did not take them as my guide, but went into this loss of weight question with the hope to see the bottom of it.

The first bone that was thrown to me to worry at and break my teeth over, was that fine, elastic, all embracing phrase "natural driage." "Natural driage" is a good general term, with an honest healthy ring about it and can account for much. If a shipment is half-a-cwt. or half-a-dozen cwt. short, all complaints when met in this way are hard to sustain. I knew a shipper of cinchona bark, irritated to exasperation through the loss from "natural driage." But he followed his produce on one occasion to London, saw the weighing done himself, and came out with an *increase* rather than the usual deficit to his friend's astonishment "Natural driage" is, however, a very subtle kind of thing, and in connection with cacao shipments holds the same place as the term electricity often does in the explanation of natural phenomena—an explanation which does not explain.

To test what there might be in the "natural driage" plea, I had a bushel of cacao carefully weighed just before packing and it turned out 38¾ lb; when it was weighed on arrival in London it was 40 lb. My friends there who were at one with me in their desire to understand the shortage in weight, when sending on the result of this test, which nailed the "natural driage" plea to the counter, put the thing in these few pregnant words:—"It will not help you much, in fact nothing will. The brokers and the trade will only recognise the sworn weighers' weights, and in our experience these are never satisfactory to the shippers."

When I got this length I thought of the cynical advice tendered me when I began the enquiry and which I have given above, as the words of true wisdom. Still I have a hankering after this "submerged tenth" of ours, and would gladly see it reclaimed. If necessary I would willingly subscribe my experience for the outfit of any prophet who may arise prepared to tackle the subject, and preach a reform.

The late showers were very welcome and have done a lot of good. Now the weather is taking up and the clear brightness of the N.-E. is with us again. If the cold wind will only be moderate things will be "booming."

The cooly is turning restless and thinking of home. If all were to leave who propose to do so, the labour force would be much reduced. But Ramasami does not always ride when he 's saddled.

PEPPERCORN.

HILL-COUNTRY PLANTING REPORT.

The weather is now simply perfect, the wind having ceased and the morning and evening temperature being that of an English summer. There is, of course, tropic heat of an emphatic character during the day. There is not a sign of rain; and the only modification of the clearness of the sky arises from the smoke of burning patanas which is floating about, and this raises a curious question. According to the Coorg Forest Report quoted in the *Observer* the other day from the *Tropical Agriculturist*, the effect of the annual burning of grass growing in forests is to improve the soil by adding to its stock of nitrogen. Mr. Bramber, the Indian tea chemist, on the other hand takes the view generally held that it is the annual burnings which keep grass lands so poor in nitrogen. The premises granted, how are we to reconcile the opposite effects? For, be it remembered, the falling leaves in the forest are burnt equally with the grass.

BARK AND DRUG REPORT.

(From the *Chemist and Druggist.*)

LONDON, Jan. 8th, 1891.

ANNATTO.—Prices are a shade easier as compared with the last auctions, and 36 bags of good seeds from Ceylon sold at 2¼d per lb. For a parcel of 50 bags fine seed from Ceylon, an offer of 2d per lb. was refused, 2¾d per lb. being named as the price.

COCA LEAVES.—Of 5 bales South American leaves offered none were sold. Thin, dusty, and very broken Truxillo leaves are held for 1s per lb. A parcel of small, thick, dark brown damaged Ceylon leaves was offered at 4d per lb., but there was no demand. New York quotes higher prices—viz., 1s per lb. c. i. f. for light green Truxillo, while Huanoco leaves are reported out of stock.

OILS (ESSENTIAL).—Of 100 cases Citronella, 20 cases (in tins) sold at ⅞d per oz. Nine cases cinnamon-leaf oil sold at 1⅜d per oz.

QUININE.—We have not heard of any business in this article this week, but the market has become very dull, second-hand German bulk being offered today at 1s per oz. At the auctions 5,000 oz. B. & S. second-hand in 100-oz. tins were bought in at 12¾d per oz.

NOTES ON PRODUCE AND FINANCE.

(From the *H. and C. Mail*, Jan. 9th.)

ENGLISH REGISTERED INDIAN TEA COMPANIES.—There are altogether *sixty* different companies, with capital varying from £11,800 up to £354,000, and with an *aggregate* paid up capital of nearly £4,800,000. Add to this the mortgage debentures of about £700,000, and we arrive at a total capital expenditure of 5½ millions sterling. The cultivated area of the sixty concerns totals up about 115,000 acres. In addition to this, of course, there are all the Calcutta registered companies, as well as the innumerable *private* properties, many of which are very large, so that we shall not be far wrong in estimating the entire capital sunk at something near to 10 millions sterling. It is remarkable that with so large a block of stock the property is still so very unmarketable, and that at all times it is alike difficult either to realise or to acquire even a very small number of shares. Time, and also a more extended knowledge of the conditions under which the vast enterprise is carried on, will, no doubt, eventually cause an alteration in this prospect. Already, as has before been mentioned in our columns, various efforts of a substantial kind are being made both to induce holders to turn over their stock and to induce investment companies, private investors, and insurance and other bodies to direct their attention to these much neglected securities.

THE GROCER DARE NOT GO BACK TO CHINA TEA.—In connection with a statement made in an article on the Board of Trade returns in yesterday's *Times*, to the effect that a revival of the China trade may be expected, the following from the *Grocer* of last week is interesting. In its reference to Indian tea it says:—The consumption is again on the increase, and the total deliveries for the year 1890 will be over 103,000,000 lb. against 99,000,000 lb. in 1889, or an increase of over 4,000,000 lb. for the year, while in 1889 the increase was 11,750,000 lb. over 1888. The strides that Indian tea is making in public favour are only equalled or excelled by Ceylon growths. The public will have strong and dark-liquoring tea irrespective of flavour, and the grocer finds that only India can supply it. The value that the grocer has been able to get from 8d to 10d per lb. is striking, and he has been obliged to make use of Indian growths freely, to the detriment of poor China. Last year China teas were exceptionally poor, but although they have been better this year, yet the grocer has so cultivated the public taste that *he dare not go back to China tea*: except in the smallest way.

CHINA TEA PROSPECTS.—Messrs. W. J. and H. Thompson, in their China Tea Circular take a hopeful view of the prospects of China tea. They say:—For the past year we have to note a very satisfactory increase in deliveries, home consumption showing seven millions and export one million in excess of last year, the total amounting to 231 millions, against 223 millions. The stock on December 31st, 1890, was 11 millions less than at the same time in 1889. The large increase in the home consumption is, no doubt, chiefly owing to the reduction of duty in May last from 6d to 4d per lb., but also to the improved state of trade, which has, to some extent, benefited the large consuming classes. The increase in export from this country was quite unexpected early in the season, owing to the large purchases made in China for Russia; but the supplies of suitable qualities proving inadequate, considerable orders had still to be executed in this market. The figures for export include nearly four millions of Indian and Ceylon teas, which seems growing in favour in Russia as well as in other countries. The quality of the crop from China was again disappointing, but, in consequence of the moderate supply, prices for the finer grades of black-leaf Congous ruled very high, and were mostly taken for export. Shippers from the northern ports have had reason to be satisfied with results; from Foochow, however, the reverse has been the case, except as regards the finest chops, which sold at good profits. The quantity of the lower grades has been comparatively large, had been met with small demand beyond the moderate requirements of the trade for these classes. The total export from China promises to be about 20,000,000 less than last year, and as the deliveries for the last six months have been almost equal to the corresponding period in 1889, and with much reduced stock, the position of China tea must be considered more favourable than for some time past.

CEYLON TEA.

The *Grocer* says:—The total consumption for 1890 is nearly 38,000,000 lb. against just over 30,000,000 in 1889, and 18,500,000 lb. in 1888, thus showing an increase of nearly 8,000,000 lb. for the year, and 19,500,000 lb. for the two years. The supply for the year is about 40,000,000 lb., and the stock has increased some 3,000,000 lb. to, say, 8,500,000 lb., or two and a-half months' stock, which may be considered very moderate and quite necessary recollecting the steady, all-round demand there always is for Ceylon teas. The year's crop of 1891 is now estimated to yield 50,000,000 lb. for the London market, so that consumption will again have to make great strides to keep pace with such an import. Now the question arises, What is this extra supply to take the place of? China Congou for home consumption is already so small that it cannot well be smaller, unless it is to be wiped out altogether. Perhaps these teas will rapidly increase in favour on the Continent, and if so, it would prove a great relief—otherwise we cannot but foresee a fall in prices before the summer, which would prove very disastrous to this deservedly popular British possession. Still, the trade has little to do with this question, as supplies are so evenly regulated that dealers only supply their wants week by week; the sale of Ceylon is also so steady that buyers require to hold stock.

THE EXTENSION OF FRUIT CULTIVATION.—We learn from the *Pall Mall Gazette* that about London, in almost every direction, but especially towards Farningham, in Kent, an added extent of land is being prepared for the growth of fruit. Fields many acres in extent, are wholly arranged for Strawberries. There are scores of acres being planted with Current bushes. For the most part this vast area of fruit is destined for jam-making, an industry very large in London, which the policy of the Government as to sugar at one time placed in jeopardy. An estimate has been published in an official document, that seven of the principal jam-makers and confectioners in London use 34,000 tons of sugar per annum. It has been estimated that the quantity used in Scotland for similar purposes is about 40,000 tons per annum. The soil and climate of parts of Scotland are admirably adapted for Strawberries, and, as far north as Aberdeen they are produced very extensively.—*Gardeners' Chronicle.*

THE RAINFALL OF LAXAPANA ESTATE, MASKELIYA.

Laxapanagala, "the mountain of the hundred thousand lamps," is so called because bands of pilgrims to Adam's Peak were and we suppose still are in the habit of congregating at its base and there lighting their lamps at midnight preparatory to the ascent of the mountain of the Sri Pada (sacred footstep), so as to reach the summit before sunrise. It is one of the chief flanking ranges of the central mountain, and nearly 6,700 feet above sea-level, so that it ought to and does intercept a considerable portion of the rainfall of the south-west monsoon. But the estate of Laxapana is evidently less fully exposed to the monsoon current than is Theberton at a straight line distance of three miles; for while the average rainfall of Theberton (the rainiest position on the Surveyor-General's map) is 217 inches, the average of Laxapana is only 147 inches. Mr. George Greig, in sending us his very interesting diagram, coloured and conveying to the eye a vivid idea of the rainfall for each month and each year of the past fifteen,—notices the curious reduction, of the average from 157·35 inches in the first 11 years to 121·21 by the results of the last 4. As there seems to have been no failure of the south-west monsoon generally, the question naturally arises whether there has been any change in the locality of the rain-gauge, or any erection of buildings or growth of a grove of trees which might affect the local results? The figures on which the largely differing averages are founded, are as follows:—1876 133·30 inches; 1877, 176·10; 1878, 159·05; 1879, 177·65; 1880, 141·62; 1881, 155·83; 1882, 191·62; 1883, 151·07; 1884, 143·05; 1885, 147·53; 1886, 153·72. These are the years (11) and figures which established, apparently, the rainfall of the estate at an average of 157·35 inches. Then came the remarkable decrease which in four years brought the average of those years down to 121·21 inches, thus:—1887, 118·80 inches; 1888, 133·52; 1889, 125·90; 1890, 106·61. In this the lowest year of all at Laxapana, the rainfall at Elfindale, down the valley, was considerably more than double the quantity, not less than 249·33 inches. We have little doubt that the record for the neighbouring Theberton will considerably exceed 200 inches, so that the persistent diminution of rainfall at Laxapana for 4 years, until we get only 106·61 inches in 1890, against 191·42 in 1882, is one of the most puzzling of meteorological phenomena we have met with. We have records of great discrepancies in particular years, but here we have a sunspot period of 11 years giving an average, which might well be relied on as true and permanent, of 157·35 inches; while the average of 4 years succeeding 1886 gave an average of only 121·21. The average for the whole fifteen years was thus brought down to 147·71 inches. We might adduce the explanation of the commencement of a cycle of drought in 1886, but for the continuance of records of normally heavy rain in the neighbourhood. We seem shut up, therefore, to some local cause of changed position of rain-gauge shelter, of buildings or trees, change of the gauge itself, or change in the observer?

The monthly averages are given as follows:—January 2·67 inches, February 2·28; March 5·09; April 10·35; May 17·85; June 27·19. In 1888 the rainfall of this month at Laxapana was 44 inches, against the enormous deluge of 84 inches at Theberton; July 22·20; August 18·75; September 12·14; October 16·68; November 9·65; December 7·76.

Looking at the rainfall map, it is interesting to notice how the deposit of moisture increases as the monsoon current sweeps from the western shore at Colombo, inland. The average at Colombo is in round figures 89 inches; then a little to the eastward amidst the foot hills is Labugama with 161 inches; at about an equal distance again, and still amongst the lower hills comes Pambagama with 163 inches; finally we come to the rainiest centre in our mountain region and find Theberton, at the elevation where the mass of the rain clouds strike and are cooled down by the mountains, 3,315 feet, with 217 inches. But for some intercepting hill or spur, Laxapana ought to be well up to a similar figure. Local features, however, divert both wind and rainfall very materially.

GAS DIRECT FROM THE MINES.

Dear Sir,—Having read with interest the letter of Hon. R. Russell on the abatement of the smoke nuisance, and having experienced the difference in Pittsburg, U.S.A., since natural gas was introduced there, I beg leave to submit the following suggestion.

In the United States natural gas is already piped fifty or sixty miles, and it has been proposed to pipe it 250 miles or more to the seaboard. Fetching the crude coal to London by rail involves using a car that often weighs as much or more than its load, the car having to be hauled back empty. The coal then has to be hauled to the house, carried to the cellar, carried up to the fires, and finally, the ashes carried away, and the soot and dirt created in the room cleared up. As a matter of fact, we consume our coal at great loss by first heating it in the grate and then burning the gas it evolves.

As I sit by a glowing gas fire, I, imagine that—

1st. The gas consumed in London is immensely enhanced in cost by the transportation of the raw coal to the gas works in the city.

2nd. That a very cheap *heat* gas could be produced from coal.

3rd. That gas could be manufactured *at the mines* (the nearest of which are about 110 miles from London) and piped to the City with great economy and at a great reduction from present rates.

4th. That the towns and dwellers along the route between the mines and London would take a liberal supply also.

There may be some practical difficulties to be overcome, such as forcing or sucking gas long distances, leakage of the pipes, etc., but these do not seem insuperable nor even very great.

The cost of the plant, in pipes, may be large, but the economy would seem to be so great as to recoup that.—Respectfully. HORACE J. SMITH.

44, Grosvenor Road, London.

—*Speaker*, Dec. 27th.

INCREASED DEMAND FOR JUTE.

Government encouragement for the production of jute in the lower Mississippi valley has proved a failure. The quantities raised are not sufficient to cover even a small fraction of the annual cotton crop. Even under high cultivation the plants have failed to obtain the luxuriant growth of those raised in India. The difference in the cost of labor in India and this country, together with climate disadvantages, apparently renders it impossible for us to compete in the production of this article.

The plant requires a very strong soil and comparatively little cultivation. The regions in which it is grown were originally swamp lands, which were carefully drained under the direction of the English government. Being carried to Dundee as ballast over fifty years ago, it fortunately came under the inspection of a French weaver, who studied its properties

and succeeded in making the first yard of jute bagging Dundee has ever since been the chief manufacturing centre of articles made from jute. From 207 208 bales imported into Dundee in 1870, there was a rapid increase, until in 1883 the imports amounted to 1,013,109 bales. Within the last seven years new methods of decorticating jute have been invented, and cloths of finer texture can now be made, so that the increased demands have caused the imports to advance even more rapidly than during the preceding thirteen years.

Many substitutes have been tried for jute by southern manufacturers. None of these have as yet been made a success. Cotton bagging has been made for several years. The objections have been the expense and failure to protect the cotton from dirt and moisture. Several of the firms which have tried to manufacture it have either failed or turned their attention to some other field until there are but two left, and these are doing business only on a small scale.

The process of making cheap bagging from the fibres of the cotton plant is still in its infancy. Favorable reports of its development have been received from several sources during the year. This may in time prove a success, but at present the outcome is doubtful.

No material is manufactured at less cost per yard than jute. After cost of production, shipment to Calcutta, insurance charges and ocean freight have been added, it is placed upon the American market at an average price of 3c. per pound, and at this low rate the profits are large. The bagging made from it is exceedingly strong and can endure almost any amount of rough handling. It has frequently happened that when cotton bagging has given out in course of transportation jute bagging has been substituted. Many steamship lines refuse to carry cotton as freight if covered with any substance other than jute.

The increase in the size of the cotton crop is well shown in the increased demand for jute bagging. The mills, although they have been greatly enlarged within the past year, find it impossible to keep up with their orders. Manufacturers have given consumers the benefit of the change in tariff rates. The imports for the last ten years in tons were as follows:—

	Tons.		Tons.
1880	82,471	1885	98,343
1881	68,631	1886	83,054
1882	84,186	1887	88,514
1883	125,318	1888	115,163
1884	64,389	1889	88,665

—*Bradstreet's.*

LABOUR SUPPLY IN THE STRAITS.

EX-CEYLON PLANTERS GIVING EVIDENCE.

LABOUR COMMISSION.—Present, Capt. Cameron, Messrs. Powell, Turner, McGregor and Brown.

Mr. John Anderson recommended a Government agency in Singapore, abolishing independent coolie depôts and brokers. If the Chinese Government could be persuaded to co-operate in the emigration it would do good. There should be fixed rates for brokerage and importation expenses, and over-charges should be made penal. The trade should be encouraged to remain in Singapore as a distributing centre. Direct traffic with North Borneo was not to be encouraged. Cost to Darvel Bay would be $65, while through Singapore it was about $95. He thought the direct traffic to Sumatra from China was no cheaper, and in some cases dearer, than through Singapore. He objected to estates being harassed by medical or other Government officers, when if left alone they were getting well enough. Witness had been in the Government service (laughter). The Trafalgar Estate would be better closed than further hampered.

At 1-30. the Commissioners adjourned until Monday, at 11 a.m.

Singapore, Jan. 19th, 1891.

Present :—Capt. Cameron R. E. President, Messrs. J. Turner, A. Macgregor, E. A. Brown (Secretary) and R. P. Gibbes (Assistant Secretary).

Mr. C. E. St. Caulfield, Manager Pulo Obin coffee and pepper estate, had been connected with the estate for nearly three years; in the Straits 9 years and in Ceylon since '58. Free Tamils are employed on Pulo Obin, formerly Javanese were employed there, and over also indentured coolies. The latter were unreliable in their work and regularity, and were more expensive, so their indentures were cancelled and they were employed on higher pay as free coolies. He used to be on Loon Choo estate. Did not see any way to avoid unsatisfactory Contract labour. The headmen bring enough. He considered it unsatisfactory to take a coolie to court at present. A monthly indenture was sufficient. Of course if any inducement the coolie would leave but the contract had no effect in that respect, the only way of keeping the men being by offering them sufficient inducement to stay. The headmen got them from India at their own risk, being paid their charges. They receive no payment until the men actually arrive at the Estate. If they ran away before the charge is repaid the headman was responsible. They had no difficulty in getting sufficient coolies or in keeping them. The arrangements for the Native States, owing to the keen competition, were not satisfactory. When a man ran away there was a great deal of difficulty to get them back again. More protection was needed for the employers and more coolies were wanted. A system of discharge tickets, without which employment could not be obtained would be useful. That would only keep a man till the end of the month; but unless there was a good reason other employers would not take him on. That was the system in Ceylon, where there was a great demand for labour and it answered very well there. It was an understood thing among planters that a labourer was not to be taken on without knowing where he came from. The employers here should combine to fix a maximum rate of wages and work the discharge certificate system, on all estate work throughout the States and the Colony. It would not be possible to make it illegal to employ others than those with a discharge ticket; the planters themselves must agree upon it. In Pulo Obin he had sufficient coolies; the headmen brought them; there was no legal contract with headmen; their disbursement was examined. The rate of wages was unduly high but paying that rate was the only way to keep them. His coolies were paid for Sunday labour, although they did not work : this had a good effect. Twenty days was the average work of an ordinary coolie; a good man did 24. The only guarantee that a new man came fresh from India was his appearance, which was unmistakable. The tindal made a good profit out of the coolie, no doubt. Government was a large employer; it should agree not to take on men without a discharge ticket. Recruiters did exaggerate but the coolies wrote home telling their friend what they got, and that it was the usual rate of pay. The rate of wages should vary with the price of rice, say from 18 to 20 cents a day. Sufficient coolies would be got without contract or indenture of any kind whatever. The demand at Pulo Obin was not of course so keen as in the Native States, but combination would do much to prevent crimping. The exceptions would be so few that it would not matter. The reasonable cost of a coolie from India would be $10 to $12; it varied from $6 (without passage) to $17. The Planters' Association could settle as to the amount of wages to be paid for different kinds of work, and it would be fixed by the price of rice. Increased cost of carriage to a distant estate would be a fair charge on the estate.

Mr. W. Turing Mackenzie, manager of Michaelstowe Estate, Johore, and in charge of Drumduan Estate; had been in the Straits two years and 14 years in Ceylon. He had only a few Chinese. He had no indentured Tamils now, though they were nearly all originally indentured, a few being picked up here. He had no experience of indentured Tamils and wanted nothing to do with them. Had never got any new coolies here, though one trial had proved lamentable, five coolies (two persistent malingerers, and two sick ones) having cost $360. That was partly the fault of the recruiter he sent but partly the fault of Ordinance. He knew the latter was in force but did not know it threw so

many restrictions in the way. There wore so many serutinies, and then useless men were passed. The licensed recruiters interfered with his man, he believed. He was full handed at Michaelstowe, with Kelantan Malays. At Drumduan the tindal could get plenty of men. The rate paid 23 to 24 cents a day was very high; it was wealth to a Tamil, but the remedy was to let the market settle itself, importing plenty of free labour. This could not be done on a large scale but by degrees, as in Ceylon 40 years ago. Everybody should get his own men and not crimp then the rate of wages would settle itself. Government contractors offered a premium to high wages, paying $9 a month. The coolies liked Goverument service because they got nothing to do; that was laxity he supposed on the part of Government. He objected to Sunday labour but sometimes it was unavoidable. He objected entirely to the system of Goverument inspection; it gave the coolie an idea that the Government official was a superior. The estate was put into a ferment and the coolies were perpetually running to him with all sorts of complaints. That was partly owing to the manner of tho inspection and partly a factor of the system. Any acconnts to be rendered and books examined to see that the coolies were properly paid he did not object to. Would not restrict the number of women on an estate; they could do work with the men. The rations his men got were 10 kati every Saturday, for five days work. For 4 days five kati. On this they could save 10 kati a month: *i. e.*, they lived on $1·80 a month. Was quite sure they could live well on this. In some respects Ceylon 40 years ago could be compared with the Straits: they were beginning in a small way then as we are now. The place must be advertised in India and people would then come over. He objected entirely however to Government recruiters, who did a lot of mischief.

In reply to Mr. Macgregor, Mr. Mackenzie said it would be more expensive getting them here than in Ceylon; paying for the tindal's passage and the men he got, and then 25 cents a day pay. Tea would not bear the expense; coffee would. He employed nearly all Kelantan Malays at Michaelstowe. No planter should employ a man who could not produce a discharge from his last employer. The Public Works Departments and contractors took away a lot of men; a contractor could not be bound down not to take men away from estates but Government ought to import its own men. He did not object to a contract but "36 months was very like slavery." Three months were sufficient and if a man had not paid off his charges let the man who wanted to crimp him pay it off. He did not think a high rate of wage would have much effect in increasing the regularity of the coolie working. If a man began to save he was willing to work harder to add to his hoard. His Kelantan men at Michaelstowe average 17 to 18 cents a day; they were much better than Javanese. He thought large numbers could be induced to come down. He had a few Javanese on fixed salaries. There was nothing in the shape of a Planters' Association in Johore; he had tried to form one but it fell through, the distances wore great. In the case of Tamils the tindal kept his accounts with the men carefully; there were very few complaints of this. The men signed a promissory note to the tindal but no agreement. A monthly contract would be sufficient, if the coolie had to produce his discharge ticket before getting fresh employment.

The commission then adjourned.—*S. F. Press.*

ADVERTISING CEYLON TEA.

The tea planters of Ceylon are certainly indebted to Messrs. Charles Mackwood & Co. and their manager Mr. Wilson Smith for a capital advertisement of Ceylon tea in the universal notice which has been taken in the home press of the sale of Galbodde tea up to 87s and 110s per lb. Here are a few specimens of the notices. The Conservative *Globe* says:—

That wonderful tea which was sold the other day at £4 7s a pound has changed hands again, it appears, at £5 10s a pound. A profitable transaction that! In this connection, we may observe, a correspondent writes to protest against the imputation of extravagance levelled against those who drink this tea. "Why, in the name of common sense," he asks, "should fault be found with us if we choose to drink tea that costs us eighteenpence a cup? No one attacks winebibbers who pay double that for a glass of some rare vintage."

The Radical *Star* again:—

Tea at £4 7s per Pound. J. S. Holloway, 29, Mincing-lane, writes:—A short time back you made mention in *The Star* of a special lot of tea that sold in public sale at £1 10s 6d per pound. Today (Tuesday) a parcel of golden tips, containing 15 pounds in all, sold at £4 7s per pound. Never since tea has been known has such a price been given. It came from the well-known Gallebodde Estate in Ceylon. A hands mo profit has since been offered for it.

The *Chemist and Druggist* has the following notice:—

EXTRAORDINARY TEA PRICES.—The highest price by far ever realised for tea in London, and probably any where else, was paid this week for a small parcel of 15 lb. flowery orange pekoe, from tho Gallebodde estate, in Ceylon. This parcel was sold by public auction amid a scene of great excitement at the price of 87s per lb. in bond. The highest price ever known previously was paid a few months ago for an equally small consignment of Ceylon tea from the Hethersett estates, which then realised 30s 6d per lb.—a price that has probably stimulated the Ceylon planters to send over tho present parcel. A sample of the tea, which we had occasion to inspect today, shows it to consist mainly of very small tips of a colony resembling that of pale Turkish tobacco The tips, have been evidently separated from the larger body of black leaves of the tea by the process of pressing a piece of flannel upon the bulk. By this method the tips in question, being covered with a fine down, adhere to the flannel, while the smoother black leaves remain behind. It would, of course, be possible to obtain an almost similar tea from any fine golden-tipped Pekoe on the market, and the price obtained for this particular lot was quite a fancy one, and it will probably not be maintained, by any means, if the Ceylon planters were to send over any large quantity. It is said that part of the consignment, if not the whole, has passed into the hands of the United Kingdom Tea Co. (Li ited] of 21 Mincing Lane, and it is added that some of it has since been resold at the extraordinary price of 110s per lb. From China tea no such quality as that sold this week could have been obtained, but some of the better grades of Java tea contain a large proportion of silvery tips, which might be separated by a similar process. The finest teas have hitherto been used, as a rule, we believe, in Russia, Persia, and Morocco. Some twenty or thirty years ago the finest flowery Pekoe from China was regularly shipped to Russia either via Persia or via London, but since then that tea has gone out of fashion among the Russian consumers.

And *Colonies and India* remarks:—

Ceylon tea is certainly booming. At the London Commercial Tea Sale Rooms, in Mincing Lane, the other day, a consignment of tea from the well-known Gallebodde Estate, which experts in the tea trade describe as being the finest tea ever grown, was put up for sale by auction. The bidding for this unique tea caused unusual excitement in the sale rooms, and after being carried on with unprecedented competition between the principal firms in the wholesale tea trade the lot was at length knocked down at the amazing price of 87s. a pound, a figure which has never been anything like approached in the annals of the tea trade. The eventual purchasers of this tea were the United Kingdom Tea Company (Limited). The tea os of the most extraordinary quality, the leaves being if tho brighest golden colour, in appearance almost resembling small pieces of gold. Untiring care and attention must have been bestowed on its growth, and

it certainly reflects the greatest credit on the manager of the Gallebodde Estate that he has succeeded in producing such a perfectly wonderful and previously unheard of specimen of tea.

THE YATIYANTOTA TEA COMPANY, LTD.

Report of the Directors for presentation to the annual ordinary General meeting of the shareholders to be held on Friday, 13th February 1891, at noon.

The Directors have pleasure in submitting to the Shareholders the Accounts of the Company for the past year.

Owing to labour difficulties in the early months of the year the crop secured was less than was estimated, but as the labour supply is now ample for all requirements and as the whole Estate has been recently pruned, it is expected that a large increase in the yield will result in the current year.

The total crop was 154,303 lb. of made tea, which cost, laid down in Colombo, R39,094·35 and netted R68,344·01 or about 44¼ cents per lb. as compared with 48 cents per lb. for the preceding crop. The Directors attributes the falling off in the average price to the higher rates of Exchange ruling during the year. The expendit re includes cost of manufacturing 10,728 lb. of tea fora neighbouring estate, credit being given in the acconnts for receipts under this head.

After making the usual provision for depreciation of Buildings and Machinery, the net profit for the year (including the balance from 1889 account) amounts to R23,002·87, of wich R10,800 has been absorbed in paying an interim Dividend of 12 per cent. The Directors propose to apply R11,700 in paying a further dividend at 13 per cent (making 25 per cent for the year) and to carry forward to next year's account the balance of R502·87, which they hope will meet with the approval of the Shareholders.

Arrangements have been made for planting further 30 acres in tea this year, which will bring up the cultivated acreage of the Estate to 488 acres.

The crop in 1891 is estimated at 180,000 lb. tea against an estimated outlay on the estates of R44,200 and it is anticipated that the sum of R4,000 will be spent during the year on the new clearings of 84 acres.

In terms of the Articles of Association, Mr. A. Thomson retires by rotation from the office of Director, but, being eligible, offers himself for re-election.

The appointment of an Auditor will rest with the meeting.

Dr. BALANCE SHEET 31ST DEC. 1890.

LIABILITIES.

			R c.
To Capital—			
100 Shares at R900 per share ...			90,000 —
To Extension Fund Account—			
Balance of this Account			6,500 —
To Debts and Liabilities of the Company—			
Due to Chetties, Coolies and others as per Superintendent's Balance Sheet		10,687 84	
Due to We-Oya Tea Company Limited		810 69	
Auditor's Fee		50 —	
			11,548 53
To Profit and Loss Account—			
Balance of this account ...		23,002 87	
Less Interim Dividend paid ...		10,800 —	
			12,202 87
			R120,251 40

Cr. ASSETS.

				R c.
By Property (Immovable) held by the Company viz:—				
Polatagama Estate				
Land				64,938 66
Buildings original cost ...			23,118 42	
Less written off, viz:—				
3-10ths of R15,499 22 (1888)	4,649 76			
2-10ths of R 5,004 75 (1889)	1,000 95			
1-10ths of R 2,614 45 (1890)	261 45			
		5,912 16		
			17,206 26	
Expenditure on Clearings 1889 and 1890			8,343 49	
				90,488 41
Abamalla Land				6,686 70
By Property (Movable) held by the Company, viz:—				
Polatagama Estate				
Machinery original cost			16,159 05	
Less written off, viz:—				
3-5ths of R13,809 37 (1888)		8,285 62		
2-5ths of R 2,015 81 (1889)		806 32		
1-5ths of R 333 87 (1890)		66 78		
			9,158 72	
				7,000 33
Stock in Trade				
Value of Tea unsold (since realized) ...				7,359 62
By Debts due to the Company (considered good)				
Coast Advances			6,217 39	
Sundry amounts due to the Estate for lent labour &c. as per Superintendent's Balance Sheet ...			1,700 09	
				7,917 48
By Cash				
In Bank on Current Account				798 86
				R120,251 04

POLATAGAMA ESTATE WORKING ACCOUNT, 1890.

			R c.
Dr. To expenditure for year as per Superintendent's Monthly Reports ...		48,550 90	
Less Expenditure on Permanent works transferred to debit of Polatagama Estate, viz :—			
On Buildings... ...	2,614 45		
On Machinery. ...	333 87		
On New Clearings ...	6,508 23		
		9,456 55	
			39,094 35
To Balance carried down...			30,543 32
			69,637 67
To Amount written off for depreciation, viz :—			
1-10th Cost of Buildings...		2,311 84	
1-5th Cost of Machinery...		3,231 81	
			5,543 65
To Balance transferred to credit of Profit and Loss Account...			24,999 67
			R30,543 32
Cr.			
By net proceeds of 165,031 lb Tea...		73,052 06	
Less for 10,728 lb. Tea manufactured & sold for We-Oya Estate...		4,708 05	
154,303			68,344 01
By Receipts for manufacturing Tea ...			1,287 30
By Bonus on Fire Insurance 1888 ...			6 37
			69,637 67
By Balance brought down...			30,543 32
			R30,543 32

Dr.

PROFIT AND LOSS ACCOUNT FOR THE YEAR ENDING 31ST DECEMBER 1890.

To Payment of Dividend for 1889 at 25 per cent...	22,500 —
To Amount transferred to Extension Fund account...	6,500 —
To Balance carried down	475 18
	29,475 18
To Director's, Inspector's and Secretary's fees and Office Rent for the year... ...	2,000 ...
To Stationery, postages and sundries ...	192 65
To Interest	229 33
To Auditor's fee	50 —
To Balance	23,002 87
	R25,474 85

Cr.	R c
By Balance of Profit at 31st December 1889...	29,475 18
	29,475 18

By Balance brought dowu...	475	
By Balanco transferred from Working Account	24,999	
	R25,474	85

Audited and found correct.
(Signed) R. Lewis M. Brown, Auditors
(Signed) A. Thomson, W. H. G. Duncan, Chas. Young. Directors
,, G. W. Carlyon, Secretary,
Colombo, Jan. 24th 1891.

THEFT OF CACAO.

No. 5,802.—Jalaldeen, conductor of the Grove estate, charged one Jeronis Appu of Dumbukola with theft of about a lb. of cacao seed, the property of Mr. J. H. Barber, valued at 50c. The following is the judgment:—

The evidence in this case is meagro, but in the absence of any explanation from the accused as to how he eame by he cacao found in his house it is sufficiont to convict the accused. Mr. Barber's estate is robbed of cacao on the night of the 20th instant. On the morning of the 23rd, the accused is seen bringing a pot of ripe cacao seeeds cently shelled and concealing it in the spout of the houso where ho is a lodger. He lives within ten chains of the trees from which the pods were broken off. The seeds in his possession appear to have been shelled about three days before they were brought to the house, tallying thus with the time when the pods were stolen. In quantity they answer to the quantity which would be the outcome of the stolen pods. The seeds were obviously put away from observation, for they were concealed inside a spout over wbich the two eaves of the maduwa and the house meet. That is not a place where an honest man would stow away cacao seeds honestly come by. The poor old woman in whose house the accused lives, frighteued by the discovery of the caoao seeds, which she found in the pot the accused was seen stowing away in the spout, calls in a labourer or watchman of Ukuwela estate and gives him information of what she had seen. She is a most truthful old creature and was no doubt impelled to give tbis information by the thought that if the stolen cacao was found in her house, she may be m ade responsible for it. At all events, that very day tho arachchi comes with the conductor and takes the cacao from wbere it was concealed. The accused was not in the house at the time, but it is clear that either he or the old woman must have put the cacao there. I believe upon the evidence that the accused put it there. He has elicited from the arachchi of his village by cross-examinatiou what I could not have elicited, viz., that he has the roputation of being a thief in the village. He is besides a conviotod gambler. He bas practically no defence to make. His witnesses whom he called provo nothing, and he does not in the smallest degree account for the cacao seeds found in his possession.

When within a fow days of the theft of cacao from a complainant's trees, the accused is found in possession of cacao seeds, recently shelled, corresponding in quantity to what would be the outcome of the stolen pods—tho cacao seeds being further put away into an out of the way place within the precincts of where the accused lives and obviously put away for concealment,—I think I am reasonably entitled to conclude, in tho absence of any satisfactory explanation, that the accused is the thief.

I find the accused guilty and sentence him to two months' rigorous imprisonment.

(Signed) J. H. EATON, P. M.

THE CEYLON SPINNING AND WEAVING COMPANY, (LIMITED).

Report of the Directors for tho year ending 31st Dec. 1890, presented at the general meeting held at 1 p.m. today.

The Directors now submit the annexed statement of accounts up to 31st Dec. 1890, from which it will be seen that the net available balance is R8,456·63; this is equal to over 5 per cent per annum on the paid-up capital for the five months the Company has been working, but, at this stage of the Company's existence, and in view of its requirements, the Directors recommend that a sum of R4,000 be placed to a Reserve account, and that the sum of R4,456·63 be carried forward. Tho erection of machinery occupied the early months of the year, and the getting of the various appliances into working order (necessarily a slow process) cannot bo said to have been accomplished till the end of July. The working period therefore comprises the months from August to December inclusive. During that time steady progress has been mado in Spinning and Weaving, and it is expected that a gradual increase in production will now take place. The Directors have felt that the prospects wore sufficiently encouraging to warrant them in ordering 68 moro looms. Six of these have arrived, and the rest are on the way, and will be erected in the existing Weaving Department, thereby filling the present available space in it. In order to pay for machiuery, it will be necessary to rise some additional capital, and it is proposed to do this by the issue of debentures, or by such other means as may be considered moro favourable iu the interests of tho Company. The directors consider that the results attained so far go to show that the expectations formed at the formation of the Company are likely to be gradually realised, and they congratulate the shareholders on the prospects before them. The directors who retire are the Hon. J. J. Grinlinton and F. J. de Saram, Esq., and they are eligible for re-election.

BALANCE SHEET OF THE CEYLON SPINNING AND WEAVING COMPANY, LIMITED.

Made up to 31st December 1890.

Dr. Capital and Liabilities.	R	c.	R	c.
I. To Capital :—				
3,667 Shares paid R100 per Share	366,700	00		
120 do 80 do	9,600	00		
55 do 60 do	3,300	00		
50 do 40 do	2,000	00		
60 do 20 do	1,200	00		
48 do 10 do	480	00		
			383,280	
4,000				
Particulars of arrears will be found noted below.				
II To Debts and Liabilities :—				
Debts for which acceptances have beea given ...	291,261	13		
Debts for Machinery and Stock in Trade	17,952	73		
Balance of Wages due ...	3,672	22		
Petty Cash	4	96		
			312,891	04
VI. To Marine Insurance Fund			730	00
VII. To Profit and Loss ...			8,456	63
			R705,357	67

Cr. Property and Assets	R	c.	R	c.
III. By Property held by the Company :—				
Immovable Property :—				
Freehold Laud	15,116	44		
Buildings	145,038	75		
			160,155	19
Movable Property :—				
Fixed Plant	123,140	97		
Spinning Machinery ...	190,803	38		
Weaving do ...	106,269	26		
Ginning do ...	2,790	64		
Furniture	1,126	53		
			424,130	78
tock in Trade :—				
Cotton	27,442	80		
Yarn in process, Yarn and Waste	9,298	40		
Cloth in Stock and Yarn in Weaving Room ...	28,482	31		
Stores	22,358	35		
Fuel	2,335	48		
			89,917	
IV. Debts Owing to the Company :—				
Debts for which the Company holds Bills	3,703	12		
Debts for which the Company holds on Security ...	1,952	73		
Colonial Store Deposit ...	50	00		
Interest due by Shareholders iu arrears	1,635	05		
Consignment account ...	22,619	72		
			29,960	62
V. Cash iu the Bank of Madras			1,193	71
			R705,357	67

STATEMENT OF PROFIT AND LOSS FROM AUG T 31ST DECEMBER 1890.

Dr.	R	c.	R	c.		c
To Yarn Production Account Balance 31st July ...			24,774	26		
Cottou Expeuditure	77,499	25				
Stores do ...	1,302	91				
Fuel do ...	2,035	90				
Wages do ...	8,825	83	89,663	89		
			114,438	15		
Less Yarn transferred tn Weaving Room ...			50,040	12		
					64,398	03
To Cloth Production Account Balance 31st July ...			29.531	58		
Yarn received from Spinning Rnom	50,040	12				
Stores Expenditure	4,704	69				
Fuel do ...	2,035	90				
Repairs do ...	188	56				
Wages do ...	10,727	93	67,697	20		
					97,231	58
Agents and Sccretaries, Allowancc for Office Establishment ...	2,500	00				
Agents' Commission ...	1,884	53				
Salaries ...	3,875	00				
To Priuting and Stationery, Stamps & Telegrams ...	880	07				
Charges,and Transport and Tolls ...	1,484	73				
Interest ...	5,354	15				
Rents ...	577	00				
Directors' Fecs ...	1,250	00				
Auditors' Fees ...	200	00				
Fire Insurance ...	552	00				
Legal Expcuses ...	75	90	18,633	38		
Balance net Profit ...					8,456	63
Total Rs.					188,719	62
Cr.						
By Yarn Sales ..			59,505	13		
Add, Value of Cotton in Mixiug Room ...	2,794	92				
Add, Value of Yarn in Process ...	3,805	35				
Add, Value of Yarn in Bales ...	1,503	80				
Add, Value of Waste, &c. ...	1,194	33	9,298	40		
					68,803	53
Cloth Sales ...			88,783	72		
Add Value of Yarn in Weaving Room	8,077	41				
Add Cloth in Stock	20,268	89	28,346	33		
					117,130	05
Transfer Fees ...					100	00
Miscellancous Rcceipts					2,686	04
Total Rs.					188,719	62

Examined and found correct, S. T. Richmondy W. E.Taylor, Auditors.

RAILWAY TRANSPORT OF CARDAMOMS:

THE NEED OF CONSIDERATION AND ATTENTION IN KANDY.

One interested writes to us about a matter which doubtless affects all cardamom owners in the Kandy districts and which, therefore, ought to receive the early attention of the Railway Traffic Manager. The complaint is as follows:—

With cardamoms sent down green for curing in Colombo, quick transport is *the* essential to success. On an estate 8 milos from Kandy, we send off coolies specially after 4 p.m. with cardamoms who reach Kandy at say 6 p.m. These cardamoms are not forwarded by the Railway authorities till tho 1 p.m goods train of the following day, reaching Colombo about 7 p.m. (too late for removal), and reach the Colombo store about 10 a.m. on the third day. There is a goods train which leaves Kandy at 5 a.m. in the morning, but all goods for it must reach Kandy before 5 p.m. of the day before, as the goods office closes then. And although we have sent coolies in by night to arrive at Kandy at 4 a.m. goods will not be received after 5 p.m. of the day before for the early morning train.

Now surely some arrangement might be made to allow of quicker transit, either by opening the goods office for a short time at a later hour say 9 p.m. or by allowing goods brought at 4 a.m. to be forwarded by the morning train.

TEA IN LAGGALA, MATALE EAST.

EXTENSION OF CULTIVATION.

There can be no question that Messrs. Barlow & Co. (large Manchester dealers in tea) have got a splendid bargain in the group of properties which includes Brae, Lauragalla, Foyers and Dell, covering some 1,083 acres of which 180 are in tea, the price being £4,500 cash. A short time ago, the group was valued at over £6,000 for a Company. The tea on Brae is very fine, and it is the intention of the purchasers to open and plant some 300 acres additional as soon as possible perhaps this year.

The same firm is likely to purchase the Hattanwella and Rock Park properties in the same district.

CULTIVATION OF RICE IN RUSSIA.—The Russian Agricultural Department is about to attempt the cultivation of rice in the southern provinces. The rice with which the experiments are to be tried is an early and quickly-ripening variety found in China. It is a very difficult matter to obtain this rice, for its sale to private individuals is prohibited.—*European Mail*, Jan. 16th.

VALUE OF MINERALS AND GEMS PRODUCED IN INDIA IN 1889.—The total value of minerals and gems produced in British India during the year 1889 amounted to R1,72,67,357, and those in Native States to R71,70,222, making a total of R2,44,37,579. Bengal heads the list with R58,47,439 ; next comes Mysore with R51,13,104 ; then Madras with R33,78,707,; Bombay with R21,05,602 (this includes Sindh and Native States), &c., and Coorg R28,185. As regards the production of gold, Mysore stands pre-eminent with a money value of R42,62,050 ; followed by Madras with R1,39,473. The other places are Punjab R14,866 ; Kashmir R6,020 ; North-Western Provinces and Oudh R4,400 ; Bengal R2,000, and Burma R1,800.—*Indian Engineer*.

CINCHONA BARK AND QUININE.—We call attention to the very full and valuable annual Report afforded by Messrs. C. F. Bohringer & Son, which will be found on page 630. It will be observed that the price of Sulphate of Quinine which was 40s on 1st January 1822 is given on 1st January 1891 at 1s to 1s 1d ! The exports from Java have advanced steadily from 420,668 lb. (Amsterdam) in 1882-3, to 4,750,000 lb. in 1889-90, and the sales of bark at Amsterdam show a large rise last year, whilo those in London are rather less than usual. The exports from Ceylon, India and Bolivia of bark all show a falling-off, while the consumption of quinine in North America has greatly increased last year, thus,—

1889 ...	... 2,825,008	ounces.
1890 to 20th Dec.	... 3,374,300	"
Increase ...	549,292	"

Stock in London of bark show a considerable falling-off—over half-a-million lb. at the end of 1890, as compared with the close of 1889. Altogether, therefore, the prospect is of a rise in the value of bark at an early date.

TEA CULTURE IN CEYLON.

YIELD OF TEA AND COST OF PREPARATION IN MATALE EAST ON OLD COFFEE LAND AND ON VIRGIN FOREST LAND.

We are indebted to Mr. Joseph Fraser of Damboolagalla—one of the finest of Matale East coffee estates thirty to forty years ago—for affording us once again the very carefully prepared and most interesting annual statement of his experience as a tea-planter which we append. We suppose there has seldom, if ever, been published, so detailed and elaborate a return and all interested in our Tea industry may well feel obliged to Mr. Fraser for the trouble he has taken and his readiness to give publicity to his figures. The statement chiefly applies to last year; but we have added comparative figures as given for the previous three years. The steady increase in the yield year by year over all the fields will be specially noted and also the much heavier crops gathered from virgin soil, and land only cropped with cinchona, than from old coffee land. Next the extremely moderate expenditure in proportion to crops, the average cost of 154,964 lb. f. o. b. being only 28·2802 cents. per lb. notwithstanding that more than 16 per cent. of that is for "manuring." With so good a margin, Damboolagalla crop could not fail to pay well. Indeed, we may mention that the net return for the whole crop of 1889 f. o. b. is such as to make the percentage of profit on outlay, we should think as good as that of any of our celebrated Tea Companies. What Mr. Fraser says about his manured fields will be carefully noted and indeed his figures and remarks altogether cannot fail to afford much food for comparison and reflection by practical planters who are striving as well as they can to make the tea industry a profitable one.

DAMBOOLAGALLA ESTATE, MATALE.

Statement of Made-Tea secured, yield in lb. per acre, and actual cost per lb. for year ending 31st December 1890, with rainfall, and comparative yield per acre for 1887, 1888 and 1889 :—

TOTAL YIELD OF 383 ACRES AND COST PER LB. F.O.B. COLOMBO IN 1890 :—

	Cost per lb. cts.	Total Cost. R. c.
Superintendence	...3·7834	5,862 83
Tools	... ·2059	319 01
Lines	... ·0159	24 68
Stock	... ·0897	138 91
Roads	... ·1983	307 30
Clearing up Ravines	... ·0999	154 81
Fire Insurance	... ·1218	188 75
Timber Trees	... ·1809	280 34
Contingencies	... ·5488	850 40
Supplying	... ·2265	351 02
Manuring and Burying Prunings ...	...4·7672	7,387 38
Drains	... ·4457	690 69
Weeding	...2·9119	4,558 88
Pruning	... ·6943	1,075 92
Tea Factory	... ·1099	170 31
Plucking and Baskets	...8·1771	12,671 68
Manufacture	... ·7702	1,193 66
Fuel	... ·4801	743 91
Packing Cases, Lead &c. ...	...2·2596	3,501 60
Tea House Sundries and Upkeep of Machinery	·2566	397 70
Transport to Colombo	...1·3723	2,126 51
Shipping	... ·5312	827 87
154,964 lb. Tea @	28·2802	43,824 16

RAINFALL 1890.

	Jan.	Feb.	March	April	May	June
Inches ...	8·13	8·32	1·34	14·87	3·48	11·05
No. of days ...	13	14	8	21	10	19

	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Inches ...	10·36	6·27	9·00	7·26	11·90	9·62	101·60
No. of days	22	20	21	22	24	15	209

DAMBOOLAGALLA ESTATE.

Statement of made Tea secured and yield in lb. per acre and cost per lb. for year ending 31st December 1890:—

Field No.	1	1A	2	3	4	5	6	7	8	9	Total from old Tea and 20 acres of young tea.
Age of Tea......	6 to 7	6 to 7 and 2½ to 3½	5 to 6 and 2½ to 3½	6 to 7	5 to 6	5 to 6	5 to 6 and 6 to 7	5½ to 6½	5½ to 6½	5½ to 6½	
Acres............	4	20	35	12	33	40	21	15	30	40	250
Made Tea in lb.	3,613	8,131 P P	12,731 P P	5,180 M	18,094 M	28,384 M	8,434 P P	7,781 M	8,798 P	25,582 P	126,732
lb. per acre.....	903·25 N P M	406·55	363·74	431·75 N P	548·33 N P	709·60 N P	401·62 P M	518·73 N P	293·26	639·55	506·93

YOUNG TEA.

Field No.	10	11	12	13	14	Total from young Tea	Grand Total	From original toppings
Nature of land when planted in Tea	23 years in Coffee and Grass	30 to 40 years in Coffee and Grass	44 years in Coffee	44 years in Coffee	22 years in Coffee			
Age of Tea............	3 to 4	3 to	3½ to 4½	3½ to 4½	2 to 3			
Acres in Tea..........	14	10	32	52	25	133	383	
Made Tea in lb........	6,601 P	4,455 P	6,394 P	7,734 P	2,565 P	27,749	154,481	483 =154,964 total lb. despatched
lb. per acre..........	471·50	445·50 M	199·81	148·73	102·60	208·64	403·35	average yield from the whole area plucked

NOTE.—N. P. not pruned within the year. P. pruned within the year. P. P. Part pruned within the year M. manured within the year. P. M. part manured. Over the whole pruned area the prunings were buried. Fields 1, 3 and 7, part of 1a and part of 6 were pruned late in December 1889, the pruning therefore chiefly affected the yield in this year. Manure.—Allowing 6 weeks after application for the manure to tell I find the increase in yield over the comparative field is 195 lb. per acre the first year and 100 lb. per acre the second. In the second experiment the increase was 224 lb. per acre the first year.

Having manured the comparative unmanured field in October 1890. I shall not be able to state the increaso in the second year in this instance.

The comparison with previous yoars is as follows:—

Field No.	1	1A	2	3	4
	PB	PB	PP	P	P
1889: lb. per acre	...865P	682P	313PB	337PB	320PB
	P		PP		NP
1888 do	...342PB in 4 acres		222	167P	274
1887 do	...267P		96P	130P	127P

Field No.	5	6	7	8	9	Total.
	P	P	PM		NP	
1889 lb. per acre	...437PB	344PB	400PB	299NP	512M	490 lb.
	NP		P		P	
1888 do	...348 M	188PP	203PB	143P	248PB	245 lb.
1887	...117 P	135P	140P	112P	106P	125 lb.

RAINFALL.

	Jan.	Feb.	March.	April.	
1887...inches ...	7·08	10·35	3·29	12·56.	
No. of days on which rain fell	15	10	5	20	
1888...inches ...	0·23	0·25	2·31	5·05	
No. of days ...	5	2	12	13	
1889...inches ...	7·21	0·82	5·43	7·68	
No. of days ...	13	2	11	25	
	May.	June.	July.	August.	
1887... inches	3·92	8·54	4·88	5·92	
No. of days on which rain fell	15	28	17	15	
1888 .. inches	5·61	17·13	0·79	4·21	
No. of days ...	16	27	9	17	
1889.. inches	12·01	4.23	12·81	6·87	
No. of days ...	20	23	21	15	
	Sept.	Oct.	Nov.	Dec.	Total.
1887... inches	3·84	17 72	15·75	31·52	128·37
No of days on which rain fell	15	23	21	28	212
1888... inches	6·91	13 37	10·44	21·95	88 31
No of days ...	16	21	20	23	181
1889...inches.	17·20	7·74	11·65	6 08	99 73
No. of days ...	26	14	19	14	203

In this connection, we have to ask planters fi ing the *Tropical Agriculturist* to correct an error with their pen, through a figure getting transposed on the first page of the *Tropical Agriculturist* in April 1890,—under cost per lb. Bungalows there is given ·712 cent, instead of ·172.

ANOTHER VINE DISEASE (GLŒOSPORIUM PESTIFERUM, C. & M.)—We have recently received from Brisbane some Vine shoots and Grapes suffering under the infliction of a new Vine disease, which, if it spreads, is likely to be of a very destructive character. The shoots, petioles, and peduncles present a shrivelled and miserable appearance, sprinkled, in some places densely, with small hemispherical knobs, about the size of a good-sized pin's head, and of a rosy-pink colour. Subsequent examination proved that these knobs were a mass of hyaline fungus spores, which had oozed out of orifices in the cuticle, and hardened by exposure to the air into that form. The cells beneath the cuticle are without any distinct conceptacle or perithecium, and the spores are produced upon short delicate sporophores rising from the cushion-like base of the cells. The spores, or conidia, are cylindrical, straight, and rounded at the ends, from 14 to 15 micromillemetres long and 3 to 4 broad, hyaline and colourless, with rather granular contents. When mature, they issue in a sort of gelatinous mass through orifices broken in the cuticle, and soon harden into the pin-head knobs, which remind one strongly of some of the small forms of Tubercularia, so common in this country. On the application of moisture, the spore-masses dissolve, and the spores are carried away freely wherever the water trickles. In some respects this fungus resembles another of the same genus (Glœosporium ampelophagum), common on Vines in Europe and the United States; but it differs in the colour of the exuded spore-masses, and in the dimensions of the spores, which are double the length, and broader than in the European species; besides which, we have no knowledge that the mass of spores in Glœosporium ampelophagum ooze out and form such Tubercularia-like masses. The diseased fruit is stunted, shrivelled, and exhibit a few of the spore-pustules scattered over them. It is an unenviable addition to the fungi of Australia.—M. C. COOKE.—*Gardeners' Chronicle.*

NATIVE INVENTIONS.—Mysore seems to be ahead in inventions and manufactures. A goldsmith of the Rampore village is said to have invented a plough that is light and durable and does double the work of an ordinary plough. Another man Rachappa, a resident of Chickaballapur, is reported to be manufacturing sugarcane mills on the English model which are being used in the Province by the ryots.—*Indian Engineer.*

"COCONUTS AND TEA."—We learn from an experienced tea as well as coffee planter that "coconuts and tea" cultivation conjoined is becoming a favourite style of lowcountry plantation with several old hands. In some districts of the Western Province, both products are cultivated together, and we know of one plantation at least in Henaratgoda district, where tea is cropping exceedingly well and coconuts flourishing under this arrangement. In some parts of the country between Hanwella and Moratuwa the same style of cultivation is likely to be freely followed.

ARTESIAN WELLS AND IRRIGATION.—On leaving Colombo Mr. MacBride made his way to Tutioorin and thence to some of the large S. I. Irrigation Works, such as the Godavery Irrigation Works, which he inspected; he also examined and made inquiries concerning a number of artesian wells; while, later on, in the cold districts he was enabled to see borings carried on with the very latest appliances, which are said to be of the most perfect character. Of course, Mr. Macbride will have now to inquire into the general conditions of the Northern Province and we suppose he will pay a visit to Jaffna at an early date to see if such wells are practicable there. If he finds that they are, the insight that he obtained into the boring for coal at the Raneguuge and other mines will prove of service.—*Cor.*

"COCAINE IN DENTISTRY" is the name of a paper read at the 5th annual meeting of the German Association of American dentists by Dr. Blersch, Mannheim, a copy of which is sent to us by Messrs. C. F. Boehringer & Söhne, Waldhof near Mannheim. It runs as follows:—

Employed with proper knowledge and care in minimal doses of 0.190 to 0.385 grain, cocaine is unquestionably one of the safest of drugs, and has the further advantage of being so cheap, that we can give the poorest patients the benefit of it, since even if we receive no payment at all, 0.385 grain of cocaine costs only about a halfpenny. The favourable opinion of the Prague professors concerning Boehringer's Hydrochlorate of Cocaine I can fully confirm.

IS ADULTERATION UNIVERSAL?—Speaking from an experience of fifteen or twenty years, one medical man, at any rate, is able to say that he has not found his fellow-men of the business class half so black as they have been painted. Wines, which are so commonly ordered for sick persons, are seldom or never the poisons they are said to be, unless they are purchased at poison prices. The poor, who cannot afford to pay for good wines and spirits, should leave such things entirely alone if they cannot procure them from charitable friends. An old-established wine merchant admitted to the writer quite recently that poisonous wines and spirits are undoubtedly manufactured; but then they are manufactured because there is a demand for them on the part of people who cannot afford to pay for *bona fide* wines and spirits. Those persons who can pay for genuine articles are just as sure of getting them honest and good as they are of getting honest and capable medical practice when they can offer reasonable fees for it. Exactly the same may be said of teas, coffees, cocoas, beef, juices, infants' and invalids' foods, and their makers. All these things can be, and are obtained of the highest order of excellence by people who are able and willing to pay for them according to their market value.—*Hospital.*

INDIARUBBER.

LONDON, Jan. 16.

Unfortunately my knowledge of what has been accomplished in Ceylon with respect to the growth of indiarubber plants is too restricted to enable me to judge whether you might be either prejudicially or beneficially affected by news reaching us from America as to a syndicate composed both of Americans and Englishmen having been formed with the object of buying up all the indiarubber in the world. This syndicate is said to have obtained control over fully half of the entire production of Pará rubber and that it expects to get the entire monopoly. It is intended to extend its operation, not only throughout America, but also throughout Great Britain and the European continent; and if the syndicate should prove successful, the price of indiarubber is sure to go up largely and the cultivation of the plant on Ceylon estates may be thereby much stimulated. As written above, however, it is not certain in my mind, whether the cultivation of the juice-yielding plant has been persevered with in Ceylon, or whether it has not been altogether abandoned.

THE CEYLON PIONEER IN TEA.

Mr. Leake tells me that he has received instructions from the Ceylon Taylor Testimonial Committee to purchase a silver tea service for presentation to that gentleman, but that the amount of money at his disposition for that purpose is so large that he is completely puzzled how to act. Altogether, the subscriptions out in Ceylon and at home to this fund amount to about £240. We hardly think Mr. Taylor would care to have silver to that amount, and an exceedingly handsome service, salver and everything complete, could probably be purchased for 90 to 100 guineas. So Mr. Leake is, as you will see, suffering from an *embarras de richesse*, and the local Committee here is somewhat puzzled as to how to proceed for the best. I told Mr. Leake it scarcely seemed to me to be advisable to put Mr. Taylor to the risk of keeping too costly an amount of silver in an upcountry bungalow; but he replied that he himself had been married thirty years, had had an entire service of silver in use throughout his residence in Ceylon, and that up to date he had only lost of it a single spoon! All that can be said as to this, in my opinion, is that Mr. Leake has been an exceptionally lucky man.

MANA GRASS AND PAPER.

Discussing with the gentleman last mentioned the probability of Messrs. Curtis & Harvey becoming large purchasers of mana grass in Ceylon for charcoal burning purposes, he mentioned to me that he thought it would be most uneconomical to bring the grass home for burning, and that if the charcoal to be obtained by that operation should prove to be of value, we might depend upon seeing works specially erected in Ceylon for producing it locally. He did not think Messrs. Curtis & Harvoy would be alone in appreciating the value of the charcoal if it should prove to be of a very superior quality. There is, Mr. Leake said, a very great and very unsatisfactorily supplied demand for exceptionally fine charcoal for making the filaments for electric lamps. The provision of these filaments is already a very large business, and one that is sure to receive very great extension. If, as seems to be anticipated by experts,—and I believe Dr. Evans is the authority for this anticipation,—the result to burning mana grass is likely to supply this demand, there will be ample inducement for the establishment of a charcoal factory in Ceylon. Very special furnaces must, however, be required for burning such a light and easily-consumed material as this grass. Any excess of draught over that absolutely necessary for the most gradual combustion would flash it away and no charcoal would be left. I think I told you that Messrs. Curtis & Harvoy are hoping to get 2 cwt. of charcoal from the ton of the grass they have received, but at present nothing is known to me of the process of burning by which they hope to secure such a large result.

MESSRS J. H. ROBERTS AND J. HAMILTON ON CEYLON PLANTING PRODUCTS AND TEA DISTRIBUTION—MR. ROBERTS ON EXPENDITURE FOR "NEW MARKETS" FOR TEA AS A MISTAKE: ALL THE CEYLON TEA FOR MANY YEARS WANTED IN LONDON—CEYLON *vs.* CHINA.

Mr. Roberts started conversation with the observation that he regarded the expenditure now incurring by your Planters' Association upon the discovery of new markets for your tea as mistakably incurred. "The fact is," he remarked, "we want here in London *all* the tea Ceylon can send us for many years to come. I do not hesitate to say that if you were to send us eighty million pounds it would not over-tax our capacity for reception. You could not do a more unwise thing than to starve the London markets. For every pound Ceylon sends us a pound of China tea is driven from the sale. Sooner or later, if Ceylon and India send supplies adequate to our needs, China tea will find no place here. Every day sees Ceylon tea more appreciated here, and those who have once tasted it and liked it will drink no other; even now we can barely supply all that is asked for, and we want far more than we get." Mr. Hamilton at this point interposed and observed:—"Though that is all true, a larger supply must mean diminished prices. The present average all round for Ceylon tea is about 10 pence. That is not sufficient to properly remunerate the planter. To do this as it ought to be done the average must be raised to a shilling, and this is only likely to be obtained by placing buyers for foreign markets in competition. The only question to my mind is whether, if that rate were established, the present amount of demand for Ceylon tea would remain."

To this remark Mr. Roberts replied:—"Certainly it would. I feel confident that, so entirely have those who customarily drink Ceylon tea made up their minds to use no other, that even if they had to pay twopence a pound more for it they would still continue to purchase it." "That may be," was Mr. Hamilton's rejoinder, "but it is perfectly certain that it would check development of use and then the increasing production in Ceylon would have to seek other channels for disposal." Mr. Roberts, however, thought that it would be better for the future of the Ceylon tea interest to supply every possible demand for the home market than to obtain a better price by supplying foreign countries. There is undoubtedly much to be said on both sides. We can well understand Mr. Hamilton's desire that your planters should get better prices; but on the other hand we can realize the evil which would possibly follow any curtailment of the English supply and the consequent maintenance of active competition from China, which would otherwise daily slacken, until it had wholly died out. It was singular to see how different were the views taken by two partners in the same eminent firm on this particular subject. You will be better able than myself to assess at their relative values the arguements employed by both Mr. Roberts and Mr. Hamilton.—London *Cor.*

NOTES ON PRODUCE AND FINANCE.

(From the *H. and C. Mail*, Jan. 16th.)

A COSTLY TEA.—On the 13th inst. Messrs. Arthur Capel & Co. knocked down in their Ceylon sale to Messrs. Whitworth, Hillyard, and Wade, tea dealers, of Idol Lane, E. C., a small lot of extraordinary tea, at 87s per lb. It consisted of only three boxes, each containing 5 lb. of Golden Tip, from the Galleboddo estate. Every leaf was of a bright golden colour, without any brown or black ones to mar the beautiful appearance. This is the tallest price ever paid for a tea within the memory of living men. At this price, and allowing sixty cups of toa to the pound, each cup would cost 1s 6d. *The Times* of yesterday referred to this sale of tea, and the following letter from Messrs. Whitworth & Co., appears in today's issue. "Your interesting paragraph in this day's issue under the above heading would probably much surprise your readers. They will be still more surprised when we tell them, through your kindness, that we, who were the buyers at auction of the tea at £4 7s per lb., afterwards resold it at £5 10s per lb. 'A figure which has never been anything like approached in the annals of the tea trade will therefore apply to the latter price, and not to the former, as the paragraph implies. At this latter price, cost to the consumer would be about 1s 7d a cup. We trust that Indian and Ceylon tea planters will by this be encouraged to strive after quality in their productions in preference to quantity."

SPECULATION IN TEA.—"Observer" writes to the *Financial News* as follows:—As considerable speculation has recently taken place in tea, and prices in the terminal market have risen 2½d. per lb. above those ruling this time last year, it may be interesting to many of your readers, especially those engaged in the trade, to know the exact statistical position of this article. The figures are taken from the brokers' circulars of January and from the revised estimates of the Indian Tea Association:—Stock of all sorts actually in bond December 31st, 92,800,000 lbs.; arrived, but not included in stock, 1,200,000 lbs.; afloat, all sorts, 23,222,000 lbs.; stock in bond in the outports, about 6,000,000 lbs.; total, 123,222,000 lbs. Balance of Indian crop to arrive, after deducting quantity afloat, as per revised estimate of Bengal Association, 23,000,000lbs.; Ceylon tea to arrive before June 30th about 20,000,000lbs.; Now make Congou to arrive before June 30th about 1,000,000lb; total, 167,222,000lbs. Delivery for six months, taken at an increase of 6,000,000lbs. per annum, 116,200,000lbs.; leaving a stock in hand on June 30th of 51,022,000lb. (The new season's China crop arrives in bulk in July.) From the above figures which are taken on the most favourable estimate, it would appear that on June 30 there will be a stock of 51,000,000lbs in the country, which appears very much more than sufficient, considering the rapid deterioration of tea by keeping, especially Indian and Ceylon tea, rendering the old season's almost unsaleable when the new tea arrives. There is one extraordinary fact in regard to tea, that for forty years there has never been an insufficiency of supply; there have been war scares, failure of crop scares, and insufficient supply scares, under which prices have been raised madly, to the ultimate detriment of all concerned, but there has always been amply sufficient tea; even when our sole source of supply was China. It seems hardly likely that, with India and Ceylon supplying nearly two-thirds of our consumption, and China able to send us as much as ever if prices are high enough, we shall suffer now from any deficiency.

THEN AND NOW.—Three score years ago Great Britain consumed thirty million pounds weight of tea, which was eight million pounds more than all the rest of the world, while in the interval the Colonials and foreigners have done their best to reach the Britisher, with the result that their aggregate consumption vastly exceeds that of Great Britain. But the people of this country now consume close upon 5lb. per head of the population against ½oz. in 1711 and 20ozs. in 1830. The reduction of duty last year caused an increased consumption to the extent of some 5,000,000 lb. while it seems that the combined exports of India and China are likely to be very considerably less than last year.

CINCHONA BARK IN HOLLAND.

AMSTERDAM, Jan. 14th.—All the analyses for the cinchona-bark sales to be held in Amsterdam Jan. 22nd have been published now. The manufacturing bark contains about 7 tons sulphate of quinine, or 3·6 per cent on the average, divided as follows:—About 23 tons contain 1·2 per cent; 52 tons, 2·3 per cent; 43 tons, 3 4 per cent; 33 tons, 4·5 per cent; 11 tons, 5·6 per cent; 8 tons, 6·7 per cent; 12 tons, 7·8 per cent. —*Chemist and Druggist.*

WHAT A CEYLON TEA ESTATE PROPRIETOR DOES WITH SOME OF HIS TEA IN THE EAST OF LONDON.

(*Communicated.*)

Perhaps your readers will be interested to hear of the undoubted destination of some of the Ceylon tea, as well as of the good work done in East London by Mr. P. R. Buchanan, sometime tea-planter in Assam and proprietor of Blackwater estate in Ceylon.

Unlike some of those noisy shallow philanthropists who, in their ignorance, aggravate in their efforts to cure, the diseases from which our old mother country is suffering, Mr. Buchanan determined to know the poor before he attempted to help them. So he and his wife settled down in East London, simply living among the people, making no fuss, bringing no nostrum, not even enjoying the slight éclat which surrounds the position of the Church of England clergyman even in the poorest parish of East London. Two things he learnt the poor needed (besides, of course, the one thing needful which no man can give his brother)—both of which he could help them to: one was places other than the public-houses where they could meet and have really good fellowship unfettered by any individual's particular fads. So he started a Club which soon became popular in the best sense. The men adopted it as their own, worked for it, cared for it, sacrificed for it. Mr. Buchanan added lectures, classes, a co-operative shoe-making establishment and a co-operative cabinet-making shop, billiard tables, &c. The second need he noticed among the poor was their want of good food, a want hundreds had noticed before him, but which he determined to remedy in a way that could not pauperize. So he started food houses—honest food, honestly cooked, honestly sold, honestly paid for. There a man can get his plate of beef for 2d, his bit of pudding for 1d, his basin of soup for 1½d. "Pay, yes certainly it pays some of us," said Mr. Buchanan, "it pays me, it pays the men, it pays the tea growers, it does not pay the publican." Anyone who buys food can buy tea, 1 lb. of good Ceylon tea at 1s 2d, good dusty at 10d, pekoe at 1s 4d —and excellent it is 'Where do you live?" asked the writer, of a dear old woman who was folding ½-a-lb. in her checked and spotless apron. "Out Battersea way—but I always come up once a fortnight to get my tea here; it does me better than anyone else's." To Mr. Buchanan's "Teetotums" working men pay the compliment of using them. Of many philanthropic schemes it can be said that they are used by all for whom they were not intended. But the Teetotums are in this sense exceptional—the lights, the cleanliness, the abundance of the newspapers of the day, the fair weight, the hot food, the air of independence that is in the places are all understandable goods to the workman's mind,

and they come in crowds, bringing often their wives and babies; for in Mr. Buchanan's generous management there is no rule as to one portion one person. No! if a man is in low water he can have one portion or half-a-dozen plates and knives and forks if half-a-dozen mouths are to be fed from the one portion. At first but one Teetotum was opened, but its success was soon a proven fact and four others are now opened in different large thoroughfares of East London. Mr. Buchanan imports his tea direct from Ceylon, from we suppose his own fine plantation in Ambagamuwa,—so he is his own middleman and neither he nor his purchasers lose thereby. Of the value of his work there can be no doubt, for it is a want of good food that too often is the parent of the Englishman's craving for drink. To raise the standard of comfort among the working classes is in itself a good, and one with far-reaching results.

Each Teetotum has its rooms for recreation—billiard and bagatelle tables, draughts, chess, backgammon, &c. Mr. Buchanan has taken care that those who come to play should have the chance of remaining to pray; for in each room there are papers and advertisements about "the Club" into which the men can be drafted or where they can have all those kindly advantages of human fellowship without which in a crowded city it is hard for a man to believe in a Divine and Beneficent Power.

MR. SCHWANN, M. P., ON TECHNICAL EDUCATION.

Pursuant to announcement the meeting arranged by Mr. George Wall for the purpose of hearing Mr. Schwann, M.P., on technical education came off today (Feb. 5th) at 11 a.m. at the Fort Library, under the Chairmanship of Hon. S. Grenier (Attorney-General). There were also present:—Hons. W. W. Mitchell and P. Ramanathan, Messrs. J. B. Cull, George Wall, J. H. Marsh, H. W. Green, H. H. Capper, F. Beven, and C. M. Fernando, Miss Frédoux, Rev. W. J. G. Bestall, Messrs. J. L. K. Van Dort, J. W. C. de Soysa, and J. Allport, and a goodly gathering of schoolboys from the Royal College.

Mr. GEORGE WALL briefly introduced Mr. Schwann to the meeting. He said that Mr. Schwann was associated with one of the largest technical institutions in the world, and he had no doubt that they would all be glad to hear him on the subject of technical education.

Mr. SCHWANN prefaced his remarks by saying that he regretted that amongst the many attractions of the island, there was one defect in the very rapid changes of temperature which produced a great effect on one who was not acclimatized. The effect of the temperature had produced a huskiness in his throat, which prevented him from speaking out as forcibly as he would wish in advocating the cause of technical education. He thought it was unnecessary to enter into any lengthy arguments on the subject, or to speak of the advantages of technical instruction, because the subject was not altogether new to the inhabitants of Ceylon. Several gentlemen whom he saw at the meeting (and one in particular) had already advocated the advisability of establishing a Technical Institution. Now it seemed to him that it was advisable to form an Association for the promotion of technical instruction in Ceylon, and the success of that Association would depend on those who composed it, and to this end it was indispensable that they should have gentlemen who were conversant with the subject and who would also be a guarantee to the public that the ends would be carried out in a practical and earnest manner. For the purpose of raising subscriptions and donations they would have to appoint gentlemen of some high position in the city who would be willing to lend their co-operation to the scheme, as it was evident that it was not likely that the public would support any project which had not among its supporters men who could command the entire respect of the public at large. He believed there was a building in Colombo which might conveniently act as a centre for the Technical School. He meant the Agricultural School. He believed that education in agriculture was imparted in that school, and there was no reason why education in engineering, carpentry, &c., should not also be taught there. He was glad to find that H. E. the Governor was favourably disposed towards the scheme, and he would be only too glad to accept the patronage of such an association. It was also advisable to have a number of vice-presidents—gentlemen who, although they might not take an active part in the work, yet would be desirous to identify themselves with such an institution. But it seemed to him that the chief responsibility rested with the Executive Committee, and that body, he thought, should be specially gifted and strong in their own special subjects, and that Committee should consist of men who were willing to lend their aid towards the inauguration of the scheme and who were able to satisfy the public that the objects would be carried out in a practical manner. Finally, if they got the cooperation of one or two business men, and especially a few gentlemen who were connected with the Spinning and Weaving Mills or any other industry in the town, they could have no doubts as to the success of the scheme. They also required the services of a Director, and an able man who would command the respect of the public. Mr. Mitchell, he heard, was proceeding to Europe by an early mail, and he was certain that he would select a useful man to take up the duties of that important post. He was glad to find that Mr. Green had succeeded in getting them a grant of R5,000 per annum, which would go towards the salary of the Director. For his own part, he would be happy to render any assistance to Mr. Mitchell when he was away in England, and he had no doubt that Mr. J. E. Reynolds (the Secretary of the Manchester Technical Institute), Sir Philip Magnus, Sir Henry Roscoe, and a few other gentlemen who were interested in the work that was carried on in the Technical Institute at Manchester, would cheerfully lend their assistance to Mr. Mitchell. He thought that some objections might be started against the establishment of a Technical School, but he pointed out the successful character of the industry as carried on in Manchester where an immense number of trades was carried on. There was one department where a number of people were turning out special objects of domestic utility, while others turned out small screws, which were sold to those manufacturers whose attention was solely devoted to the construction of engines, and if the industry met with such encouragement in London, where competition was much greater there than it was here, the Technical Institution was bound to flourish in Ceylon. Without monopolizing the time of the meeting, he begged therefore to move a resolution which was unanimously carried, viz. "That the following gentlemen with power to add to their number do form themselves into an Association for the promotion of technical education with the object of establishing a technical school in Colombo and for the encouragement of any movement likely to assist the application of art and science to the industries of Ceylon:—Hons. S. Grenier, A. R. Dawson, W. W. Mitchell, J. J. Grinlinton, A. de A. Seneviratne, P. Ramanathan, Messrs. George Wall, John Ferguson, H. W. Green, J. B. Cull, J. W. C. De Soyza, H. H. Capper, F. Beven, Edmund Walker, S. Rajapakse, Drs. Rockwood and H. M. Fernando." In explanation of the latter part of his resolution, viz. that the Technical school do also encourage other movements of a similar character, Mr. Schwann said that it was possible that other institutions would like to affiliate themselves with them and therefore it was desirable that a Technical Association in Colombo should have a wide basis. Apart from that fact a great number of the inhabitants of Colombo would like to co-operate with them. As regarded funds, he said that the institution to a large extent depended on the large number of *small* subscriptions

He would be more thankful if he received small subscriptions yearly, as large annual subsoriptions after a year or two died out. By this he did not of course mean to discourago those who were desirous to pay large sums annually. They conld get funds through the students' fees and other sources. In conclusion he hoped erelong to receive some information that the school was established, and he promised to render every assistance to them in the matter of getting for them anything they requirod from the manufacturers in London in order to carry on their work here. (Applause.)

Mr. GEORGE WALL in supporting the motion, said that the importance of the subject had been recognised for a long time, especially by Mr. Green, during the time when he was Director of Public Instruction. It had been said that hitherto the scheme had not assumed any definite form. That was true, but he thought it would have been a mistake to put before the publio anything of a particular definito nature until the views of those interested had bsen ascertained. He thought that after the pertinent, practical observations which had been made by Mr. Schwann they had sufficiently defined the subject and not too much defined, but left in a condition, so that those who had the interests of the scheme at heart could with sufficient freedom of action do what in their judgment seemod wise and good. He had no doubt that the gentlemen who composed the Committee would fulfil most of the conditions that were primarily necessary for the carrying out of the objects they bad iu view. In their own community there were men who were acquainted with special industries so intimately that their advice would be of paramount value, and he had no doubt but that that advice would be given by them with all cheerfulness. He believed that by the excellent management and thonghtful attention which had been given to the subject by the late Director they were likely to have the use of the necessary building without the formidable cost of having to erect them. He thonght that they would have also to obtain appliances to furnish the workshops, and he had no doubt that those who were deeply interested in the project would liberally subscribe towards the purchase of the necessary materials. He believed firmly that when the objects required wero more clearly made known to those men, that they would come forward with a liborality which would enable the Committee to go to the Government and say : " We were able to help ourselves to this extent, we pray that you would give us somo help;" and he believed that such help would not be wanting. He thought therefore that the resolution proposed by Mr. Schwann would go a long way towards supplying tho long-felt want. (Applause.)

The resolution was then put to the meeting by the Chairman and carried unanimously.

Hon. W. W. MITCHELL followed and said that it was not necessary to dilate at length upon the advantages of teohnical education to be gained by those for whom it was intended. Tho subject had been occupying a good deal of attention, and the classes for which it was more especially intended were tbe sons of the better classes for whom it was difficult to adopt the profession of lawyers or advocates. It was desirable that men should be trainod to become foremen in some of the large establishments which were being oreated in Oeylon, and that others who might not occupy that position should bo trained to somo other work. One thing which had struck him in connection with a technical school was that practical education should go hand-in-hand with theoretical education. It was cheering to learn that Government had promised to co-operate with them in the matter of granting a sum of R5,000 por annum, which wonld go towards the salary of the Superintendent, and it was very necessary that an able man should bo selected for the post for the success of tho scheme depended on him. They would of course, require a gallery of illustrations, illustrating the different industries, and they could carry on in the Agricultural School itsolf such work as carriago-building, mechanical work, engineering, telegraphing, &c., and those boys who wished to enter upon commercial pursuits could get a knowledge of all these subjects. As far as the revenue was concerned, they could make up that from the students' fees and Government grant. He thought that a good deal of progress had been made towards the inauguration of the scheme by two gentlemen who were in the room, and therefore moved the following resolution ;—"That the thanks of the meeting be given to Mr. Green, late Director of Public Instruction, for his eminent services on this behalf and to Mr. Oull for his zealous pursuance of the line of policy initiated by his predecessor for the furtherance of a Technical Institution for Oeylon."

Mr. RAMANATHAN in seconding the motion said that the subject had been occupying the attention of the community for many years. It formed the subject of an important debate so far back as 1875 in the Legislative Council, but the gentleman who led the debate, Sir Muttu Coomara Swamy was no longer alive. He believed Mr. Mitchell was also then a member of Council, and he could bear testimony to the fact that he had been greatly interested in the establishment of a Technical Institute for Ceylon. (Applanse).

Mr. GREEN said that on his own behalf and on behalf of Mr. Cull he felt very grateful to them for the compliment accorded to him. He had been working away at the question like a mole for years with a view towards forming a Technical Institute in Ceylon, and like a mole had thrown up a lot of earth, but had only got one step in advance. He thought that Government had done pretty well in giving a grant of R5,000 per annum for the salary of a Superintendent, and there was also the implied promise held out that the Agricultural School might be utilized as a sort of a general Technical and Agricultural School. There was sufficient accommodation for the purpose in the Agricultural School. One wing of the School was left open when the school was being built aud he thought that that could be utilized for the purpose and they would have shortly one good central Technical Institute, combining a technical as well as a good general education. They had a capital Professor in the school in Mr. Drieberg, and if Messrs. Schwann and Mitchell sent out a proper man to deal with other branches of the technical side, these two gentlemen would be able to give lectures to the boys of both the Agricultural and Technical sides who wished to acquire a good knowledge of a general education. He had always intended the Technical School to be one side of the School of Agriculture. There were in the country what we might call too many gentlemen and too many coolies and it was very desirable that they should make an effort to combine the two aud to get gentlemen not to think it below them to work technically and with their hands, and not to call it "cooly work." They were all grateful to Mr. Schwann for his efforts in the matter, but he thought that they should hold tho reins tightly aud not go too fast. Some of the speakers suggested that they should have a "Gallery of Illustration," and second-rate Workshops, but he thought it would be better to establish classes and march the boys round to the Government Factory, Messrs. John Walker & Co.'s workshops, the Cotton Spinning and Weaving Mills, so that they might get some practical training in those establishments, instead of having to put up workshops in the school itself, at an expensive figure. He referred to the Industrial School at Tellippalai at Jaffna, where the boys worked at all manner of things from excellent wire-mattresses down to turning out photographs and this he thought should serve as an encouragement to them as showing what could be done even in a mere Industrial school. Ho was glad that Mr. Sohwann had mentioned the question of fees, for when he was Director he was severely anathematized by by Managers of Schools for charging fees and he hoped that the Executive Committee would attend to that matter aud make it a source of revenue. (Applause.)

Mr. CULL also thanked the meeting for the compliment paid to him and humorously remarked that they once had a peripatetic school of botany, and now it had been proposed to have a peripatetic technical school. (Applause).

The CHAIRMAN said that they all felt grateful to Mr. Schwann for the conference they had held that day. It was a rare event to find a member of Parliament staying here on his travels and taking an interest in what was going on around; and not only were they thankful to him for what he had done already, but for the prospect which he had held out to them. He endorsed what Mr. Wall said, and that was that if they went to Government and said "Now we are able to help ourselves to such an extent, would you supplement what we have by giving extra?" he was sure that the Government would come to their rescue. He impressed on the members that it was of paramount importance to them that they should put their shoulders to the wheel and work with might and main, both by attending meetings and collecting subscriptions from their friends. He concluded by moving a vote of thanks to Mr. Schwann for his efforts in promoting the formation of a Technical School.

Mr. BEVEN in seconding the compliment, said that Mr. Green had rendered very eminent services in connection with the Agricultural School, and it was not his fault that he had been unable to establish a Technical Institute although he had striven assiduously to accomplish that object, but Mr. Schwann had very opportunely come and in the formation of that association they had the nucleus of something which would be very beneficial to the country. As the Chairman had remarked, Mr. Schwann was entitled to a hearty vote of thanks, and he had much pleasure in seconding it.

Mr. SCHWANN acknowledged the vote of thanks and pointed out with regard to Mr. Green's proposal to march the boys out to private establishments that the Managers of these would not like the idea, as they ran the risk of their trade secrets being exposed. Apart from that the students might sometimes saw off a finger or smash their hand on an anvil, and it was better that they should do so on property of their own than on that belonging to someone else. (Laughter.) He thought that it was necessary to have corresponding members, and he would be glad to be made one of them and be had no doubt that Sir Henry Roscoe and the other gentlemen he had named would render them every assistance. In conclusion it gave him much pleasure to propose a vote of thanks to the Chairman. It was a great advantage to have a gentleman of the Chairman's position, for it was a guarantee that the movement was of a serious and practical character. (Applause.)

Before the meeting broke up, Mr. Green suggested the appointment of two Secretaries. He therefore moved that Mr. Edmund Walker and Dr. H. M. Fernando be appointed Secretaries. The motion was unanimously carried.

We venture to append here a letter which we had written to Mr. Mitchell as our apology, for not being able to attend the meeting, but which the hurry of mailday delayed in delivery :

Mount Lavinia, Feb. 4th.

* * * *,—The pressure of work on a day like tomorrow forbids my leaving the desk within a few hours of the mail closing, or I should have been very glad, at your invitation, to make one of Mr. Schwann's auditors and to hear other gentlemen talk over with him what should be done further to extend Technical Education in Ceylon. While I am sure the result will be a very interesting meeting and that Mr. Schwann will be able to give valuable information, I do trust all concerned will be on their guard against considering experience gained in a city of the wealth and intelligence of Manchester or any other large English town as applicable to a poor oriental tropical town like Colombo or such a colony as Ceylon. We published a very sensible letter a few weeks ago from a gentleman who knows what he was writing about, a copy of which I enclose for your guidance; for I see you are credited with the intention of selecting in England in conjunction with Mr. Schwann, a fit Superintendent for the Colombo Technical Institute. But are we ready for the services of such a Superintendent as you would be likely to select and send out from England? Should it not first be clearly understood what the local want is which such an official is to supply. As Messrs. Green and Cull can tell us, a good deal of technical instruction of a very practical though unassuming character has already been done in connection with the Agricultural and Normal Schools and seeing in how many directions scientific and practical training has become available to lads in Colombo, from competent instructors, it is a question whether a very much progress could not be made, perhaps after a modest but safe fashion, with the material at our hands. Instructors for classes in Chemistry, Botany, Mechanics, Physics, in Civil and Practical Engineering and in a variety of local industries are, I believe, available, and the selection of a Superintendent *pro tem* locally might well be left to the Director of Public Instruction, until it is seen in which direction special experience is chiefly required. It may even be a question whether India (Bombay or Madras) would not supply us with the lead and experience most suited to the requirements of Ceylon better than England. In both these Presidency towns, much has been done in technical instruction.

You, as well as I, have seen so may failures from the rash introduction of "fresh blood" in the shape of "specialists" from the old country, intended to work wonders in new and old official Departments, that I am sure you will agree in the need of acting with full consideration and forethought in the present case.

We should also never forget what has already been done for the youth of the country not simply through local Schools and Colleges,—there are now, available, I believe, science, drawing, painting and music classes,—but also, after an even more practical way by the Government Factory, the Railway Engineering Shops, the large Establishment of the Colombo Iron Works Company and the many Iron and Engineering Workshops in Colombo, Kandy and throughout the planting districts, also by the various Printing Offices and last not least, what may be expected from the Cotton Spinning and Weaving Mills.

Wishing all success to the further development of technical and practical instruction in our midst, &c.,

J. FERGUSON.

NOTES ON POPULAR SCIENCE.

BY DR. J. E. TAYLOR, F.L.S., F.G.S., &C., EDITOR OF "SCIENCE GOSSIP."

Some twelve months ago I recommended people who suffered from muscular rheumatism to get well stung by a very excited beesnest—British bees, of course. Afterwards, thinking tenderly both of bees and rheumatic patients, and knowing that the former, if not the latter, lost their lives by the job, I suggested subcutaneous injection of formic acid, which is the real, but not only, cause of irritation of a bee's sting. I have myself tried it on a few friends, not being rheumatic myself. They say it did them good. Most valetudinarians say the same of their last new physic. Anyhow, it has been discovered that a person "stung" by our British bees is "protected" thereby for at least six months—after the law and rule of vaccination. Persons suffering from rheumatism are advised that they must be stung in proportion to the degree of their malady.

A French botanist has recently shown that flowers possess energetic respiratory and transpiratory functions superior generally to those of the leaves of the same plant. The assimilation is generally feeble, and much diminished by the intense respiration. The volumetric proportion of carbon dioxide (the old-fashioned carbonic acid) emitted to oxygen absorbed is always small, and less than unity.

It is now contended that the liquid secreted by the pitcher plant (nepenthes) is not in itself peptic or digestive. A French chemist and botanist, Professor Dubois, has recently demonstrated that the so-called digestive process is due to bacteria in the fluid The,

bacteria have to account for everything nowadays. I am surprised that General Booth has not made use of them in his new book.—*Australasian.*

CLEANING MACHINERY.—The simplest and most efficacious method of thoroughly cleaning the various parts of machinery that have become gummed and dirty by the use of fat oils for lubricating purposes, is by using a strong soda lye. For each 1,000 parts by weight of water take about 10 or 15 parts by weight of caustic soda or 100 parts ordinary soda. Let the solution boil and enter the parts to be cleaned; either boil them in this lye or let them steep in it for some time. All the dirt and oil resin is completely dissolved thereby, and it remains only to rinse and dry the parts. The action of the lye is such that it enters into combination with the oil and forms soap, which is readily soluble in water. In order to prevent the hardening of the lubricant on the machinery parts, it is only necessary to add about one-third kerosene. An occasional lubricating with kerosene alone is to be recommended.—*American Engineer.*

HOW TO MAKE TEA.

WILL ONE POUND OF TEA MAKE 300 CUPS?

How to Make a Cup of Tea, is a matter the majority of housewives have yet to learn. In the *Public Ledger*, Philadelphia, we find the following:—

MR. EDITOR:—My attention has been called to a query, in a recent issue of the *Ledger*, as to the accuracy of my statement that one pound of tea would make 300 cups. While the question or individual opinion upon this point may be of but little interest to the public, the actual facts in relation to an article so extensively used may be of value.

My calculation was based upon the following facts: Tea testers ordinarily use a silver 5-cent piece for weighing the exact quantity of tea required for a cup. As there are about twenty-five 5-cent pieces to an ounce, and as there are sixteen ounces to a pound, it follows, that one pound of tea will actually make 400 cups, according to the standard of strength ordinarily required by professional testers. The cups used for this purpose contain, however, one-fourth less than the average domestic tea cups. It will, therefore, be seen that after making due allowance for the difference in the size of the cups, the number will be very close to 300.

The surprise with which this statement is generally received demonstrates how little the economical features of this delicious and wholesome beverage, when rightly made, are known. If the following directions were carefully observed, and a good quality of tea used, no doubt this economical beverage would be much more generally appreciated.

Directions.—Put the tea leaves into an earthen or agate ware pot (never use metal), and stand on back of stove until the leaves get thoroughly warmed. Then pour on water that has been freshly boiled, and which is boiling thoroughly at the time. Let stand on back of stove for about ten minutes, where it will keep hot, but not boil.

At the expiration of that time the tea will be perfect and if you desire it to remain so, pour off the liquor into another vessel, so as to separate it from the leaves. The common allowance is one teaspoonful to each cup, but as some prefer more strength than others, it is evident that each tea-maker must decide for herself whether the teaspoon shall be "slack," "even" or "heaping."

In serving, have the cups and cream warm, and pour the cream into the cup before putting in the tea.

FINLEY ACKER.

—*American Grocer.*

ORANGES.—The *Tavares Herald* says that a citizen of Apopka City, Fla., has started a budded orange tree to be sent to the World's Fair, which contains eighty-five buds, bearing, representing twenty-six different varieties of the citrus family—oranges, lemons, limes, grape fruits, shaddock, etc.—*American Grocer*

BARK AND DRUG REPORT.

(From the *Chemist and Druggist.*)

London, Jan. 15th.

CINCHONA.—The first cinchona auctions of the year were held on January 13th. The quantity of bark offered was hardly so large as might have been expected from the fact that there has been no public sale here since December 16th, and that in the meanwhile the arrivals have been very considerable. The total quantity catalogued consisted of:—

	Packages		Packages	
Ceylon cinchona	1,968	of which	1,597	were sold
East Indian cinchona..	1,147	do	846	do
Java cinchona	36	do	36	do
S. American cinchona...	509	do	410	do
West Coast African cinchona	80	do	79	do
Total	3,740	do	2,968	do

A dull tone prevailed throughout the auctions, and several parcels were bought in, owing to impossibility of placing them at the limits for which they were held. The unit, though hardly as high as at the preceding sales, is scarcely quotably lower, and may be placed at about 1½d per lb. The assortment of the bark offered was somewhat below the average, although a few lots of fine Succirubra barks were shown, which realised high prices. The following are the approximate quantities purchased by the principal buyers:—

	Lbs.
Agents for the Mannheim and Amsterdam works	218,239
Agents for the Brunswick works	131,383
Agents for the American and Italian works	85,938
Agents for the Frankfort o/M. and Stuttgart works	57,410
Agents for the Auerbach factory	37,550
Messrs. Howards & Sons	34,813
Mr. Thomas Whiffen	3,050
Sundry druggists and spectators	75,337
Total quantity of bark sold ...	643,720
Bought in or withdrawn	142,886
Total quantity offered ...	786,606

A fairly large quantity of bark was secured by the firm of brokers who are reputed to act on behalf of a syndicate of speculators, and who have appeared as purchasers at the auctions of late.

JAVA CINCHONA.—Yellow branch chips 4½d to 5d; fine ground ditto 7½d; fair root 7d per lb.

SOUTH AMERICAN CINCHONA.—The only variety offered of this class of bark consisted of cultivated Bolivian Calisaya, of which about 23,000 lb were sold at from 4½d to 7d for sound broken small and irregular to good bright medium quill. A parcel of fine quality was bought in at 10½d per lb.

WEST COAST AFRICAN CINCHONA.—A parcel comprising 11,228 lb of this bark, recently imported via Lisbon, was included in the auctions. It consisted of fair bright Succirubra quill, medium size, and nearly the whole of it sold at 4½d for the best, and 3d per lb for the poorest lots. Chips bought 4d per lb. All the bark was in a more or less damaged condition.

ESSENTIAL OILS.—The market is generally quiet, Citronella being held for ⅝d per oz on the spot, while the c.i.f. quotation from Ceylon is 10½d per lb for tins, but we do not hear of any business thereat. Lemongrass 1¾d per oz on the spot, and 1 7-16ths d per oz c.i.f.

QUININE.—Business has been dull this week, and, so far as we can hear, it has been restricted to a total of about 15,000 oz on the spot (all second-hand)—viz. B & S and Auerbach at 12¼ per oz, and later on a small parcel of Brunswick at 12½d per oz. The total imports of quinine into the United States during the year 1890 are returned at 3,384,300 oz. In 1889 they were 2,431,441 oz.

"KEW BULLETIN."—As an appendix to the *Kew Bulletin* for 1890, an index to the Kew Reports for 1862—1882 has been published, which will be of great service to those interested in economic botany. The *Bulletin*, it may be added, is intended to furnish in a detailed and timely form the information formerly included in the annual reports. Serviceable as the *Bulletin* is, it does not, however, take the place which the Report used to do, and many interested in the progress of botany and scientific horticulture as illustrated in the gardens, herbarium, library, and museum, would gladly welcome an annual report as well as a monthly bulletin.—*Gardeners' Chronicle.*

TEA COMSUMPTION IN BRITAIN: RAPID ADVANCE IN THE USE OF CEYLON KINDS.

The reduction of the duty on tea imported into the United Kingdom from 6d to 4d per lb. seems really and materially to have operated in increasing consumption. The figures for 1887 were 183,561,000 lb. Then came an increase in 1888 to 185,416,000. In 1889 the increase was scarcely appreciable, the figure being 185,600,000. In 1890, however, there was a rise to 194,008,000,—an increase of nearly 8½ millions of pounds. The increase was entirely in Indian and Ceylon kinds, there being a decrease in China of 3,570,000. The increase of 8½ millions, being entirely in the stronger Indian and Ceylon kinds, may be taken as the equivalent of at least 12 millions of lb. had the standard been China. The increase in the consumption of the Indian kinds was from 96,000,000 in 1889 to 101,961,000 in 1890, or not far short of 6 millions, an increase of nearly 6¼ per cent. The increase in Ceylon teas exceeded 6 millions, the rise being from 28,500,000 in 1889 to 34,516,000 in 1890, or an increase of not less than 21½ per cent. So that, comparing the imports of both kinds, Ceylon has been taken in three fold proportion. This fact certainly confirms Mr. Roberts' strongly expressed opinion in favour of the popularity of our Ceylon teas, and this and the present good prices ought to reassure Ceylon tea planters. In the month of December the deliveries of Indian tea were 8,745,000, while the imports were 14,354,000. In the case of Ceylon, on the other hand, the deliveries in the last month of the year came close up to the quantity imported, thus:—Imported in Dec. 2,888,000 lb; delivered 2,772,000. For the last half of 1870 the deliveries of Ceylon teas actually exceeded the quantity imported, thus:—

Imported	23,906,000 lb.
Delivered	24,874,000 „
Excess delivered	968,000 „

In the case of Indian teas we get for the six months:—

Imports	67,924,000 lb.
Deliveries	59,037,000 „
Excess of imports,	8,887,000 „

Of China the record is:—

Imported	54,669,000 lb.
Deliveries	49,919,000 „
Excess of imports	4,750,000 „

and this notwithstanding the fact that deliveries for export are still very largely China: 30,000,000 lb, at least against about 2¼ millions Indian and Ceylon, or less; the exports of these kinds for the whole of 1890 being only 2,624,000 Indian and 1,431,000 Ceylon tea.—This seems also to confirm the opinion of both Messrs. Roberts and Hamilton that our lowcountry teas should be well-suited for "export" purposes to the Continent of Europe and Russia especially. To sum up: the consumption of tea in Britain is rapidly increasing, and the increase is chiefly in Ceylon, which for a crop one-third in quantity shows increased deliveries actually in excess of those of Indian, while China and Java are both receding. There are no doubt some good China teas imported, but public taste has settled the degrees of comparison as Indian better and Ceylon best. The prospects before the Ceylon enterprise are certainly bright and encouraging.

After writing the above we read the London *Times*' remarks on the Board of Trade returns, from which we quote as follows, only remarking that if a better demand is springing up for China tea, it is probably amongst blenders:—

The increase in the imports and consumption of Indian and Ceylon teas is as steady as the downward progress of Chinese sorts. Thus the imports of Indian and Ceylon have risen from 113,000,000lb. in 1888 to 127,000,000lb. and 146,000,000lb. in 1889 and 1890 respectively, while Chinese has fallen from 105,000,000lb. to 88,000,000lb. and 74,000,000lb. The consumption of Indian and Ceylon, which in 1889 was 124,000,000lb., rose to 136,000,000 lb. last year, while that of Chinese fell from 59,000,000 lb. to 55,000,000 lb. These proportions are entirely reversed as regards the exports of tea from this country, the quantity of Indian and Ceylon being only 4,000,000lb., and that of Chinese reaching 31,493,000lb. It is reported, however, that a better demand is springing up in this country for Chinese teas.

MANURES FOR CROPS.

POTASH MANURES.—The quantity of potash in most soils greatly exceeds that of phosphoric acid. Thus while in a fertile soil there may be from ·7 to 1·5 of the former, there may be only ·3 to ·5 of the latter. The weight of an acre of arable land 9 in. deep ranges from 3,000,000 lb. to 3,500,000 lb., which gives 3,000 lb. to 3,500 lb. for every 0·1 per cent of any constituent. There will therefore be in many soils from 17,500 lb. to 36,000 lb. of potash per acre, against from 7,500 lb. to 12,500 lb. of phosphoric acid. Clay soils are richer in potash than lighter and sandier soils. This abundance of potash is in itself a reason why potassic manures are less effective than some other fertilisers which contain rarer substances. Another fact in connection with potash is that it is for the most part returned to the soil in the form of straw used for litter or food for stock, so that while phosphoric acid is constantly drained off the farm through sales of wheat, milk, and young animals, most of the potash is retained. Again, farmyard manure contains about 0·67 per cent of potash, so that in applying 15 tons of dung we are adding 2 cwt. of pure potash. If farmyard manure may be viewed as a nitrogenous manure, it may equally well be spoken of as a potassic manure. The drain of potash from land is, however, constant although slow. To a certain degree it is washed through the soil in natural drainage, and it is also removed by the sale of crops. Before the discovery of the immense beds of kainit which exist in the rock salt deposits of Stassfurt in Prussia, agricultural chemists looked forward to a time when a potash salts would be in greater damand than were likely to be supplied from existing sources. Potash was then an expensive fertiliser, but since that time and for many years past potash salts have been offered at a reduced price, and are at present quoted at £3·10s. per ton ex ship. Up to the present time the demand has been limited, and it does not occur to the majority of farmers to apply kainit. It is, however, used upon certain light soils which are naturally deficient in potash, and for potatoes, beans, and clover, on account of the large amount of this alkali which they require. A good sample of kainit contains 25 per cent of sulphate of potash associated with 30 per cent of common salt, and about the same proportion of magnesium and lime salts. The remainder is water and insoluble silicious matter. 4 cwt. of kainit, it will be observed only adds 1 cwt. of sulphate of potash to the land, and a much smaller amount of potash. An ordinary dressing of farmyard manure would therefore restore as much potash to a field as half a ton of kainit, and this being the case, it does not seem very likely that the demand for potash salts will increase. The amount of potash in soils has already been stated as from 17,000 to 36,000 lb. per acre. It is not contended that this is all avaliable, although as it is usual only to analyse the fine portions of a soil which pass though a very small mesh, much of it must be attackable by growing roots —the salts of potash being easily soluble.

The following crops are known to absorb large quantities of potash taken from the soil:—

6 tons of potatoes with their tops take up 76 lb. of potash per acre.

30 bushels of beans with their straw take up 81 lb. of potash per acre.

30 bushels of wheat with their straw take up 28 lb. of potash per acre.

The astonishing fact is noted that after eight years removal of crops the final crop was rather larger where no potash had been applied than where 500 lb. of its salts had been annually applied. And yet it would not be wise to conclude that because no effect was produced at Rothamsted that potash salts are therefore not useful. It would be equally foolish to think because a great result should be obtained at Rothamsted we might expect the samo anywhere. Each farmer must be an experimentalist for himself, and hitherto we have not seen much evidence of the use of potash salts as manure for ordinary soils, such as we have seen in case of phosphatic and nitrogenous manures. They are most likely to be effective on the lighter classes of land.

Nitrogenous Manures.—The two best known members of this group are nitrate of soda and sulphate of ammonia and most of the other nitrogenous manures are refuse materials from animal bodies or from seeds. Such are all the guanos, blood, wool, fish and flesh and cake manures. The efficacy of nitrogeneous manures appears to be due to two facts. First that nitrogen in an available form exists in very small quantities in the soil, and, secondly, that it is required in proportionately large quantitios by crops. The total amount in the land may in good fields be taken in the top nine inches as 0·15 or one-tenth of the amount of potash. Nitrogen is available chiefly in the form of nitrates, and these are much more liable to wash through the soil than are potash salts. Finally, nitrogen is removed from the farm in saleable crops and in the bodies of animals in larger quantities than potash, which is largely returned both in root crops and straw to the land. There may be other reasons, but these sufficiently account for the great effect produced by nitrogenous dressings of all kinds. So rapid is their effect that it has been called "stimulating" although without sufficient reason. The crops seem to hunger for nitrogen and always present a yellow and starved appearance when it is deficient. A rank dark green appearance always accompanies a full, or over full, stock of nitrogen in the soil. It is to the grasses including the cereals, that these manures are most useful. But wherever leafy growth is desired as in the cultivation of cabbages and rape nitrogen in the form of nitrates may be applied with success. The leguminous crops, beans, peas and clover are not so much benefited by direct dressings, but they require the land to be rich in nitrates, notwithstanding. The absolute necessity of nitrates for the cereals has been amply proved. Wheat appears as if it could be grown consecutively for almost any number of years, on the same land, if only plenty of nitrates are added.

Nitrates, no doubt, if used alone, tend to exhaust the other constituents of plant food if the produce is sold off the farm. If, on the other hand, the produce is consumed at home—or if foods for stock and other manures are purchased in liberal quantities there is no fear of exhaustion. So important are they, that some times it appears as though the entire science of manuring consists in adding nitrates to the soil. The effect is, however, greatly increased if phosphates and, in some cases other mineral manures are added with the nitrates so that heavy as the crops are which may be grown with nitrate of soda, they are eclipsed by a judicious use of nitrates and mineral substances combined. In applying nitrates we prefer to use them in organic combination wherever possibe. Nitrate of soda and sulphate of ammonia are both exceedingly useful but are subject to washing through the soil by rain—the first immediately, and the second more gradually as nitrification proceeds. They act rapidly but the effect is not seen after the first season. When nitrogen exists in animal or vegetable matter its action is slower, more uniform, and is continued for an indefinite length of time. Farmyard manure is an example of this action so also are rape cake blood manure, shoddy, guano and many other substances. Such animal refuse can however hardly be classed with artificial manures, and we therefore postpone their further consideration.

Salt.—Salt is a cheap material which may be employed with good effects upon coarse rank pastures and produces the best effects when mixed with lime. Five hundredweight of salt and three to five tons of lime applied in February or March to such rank grass land tends to produce a finer herbage. Salt may also be used as a dressing for wheat at the rate of about 5 cwt. per acre. Dr. Griffith says salt eradicates couch on land infested with it. If this is the case we have an additional excellent reason for applying it. It is also a good dilutent for the better distributing of nitrate of soda and is said to check the disposition to develop too much straw which has been observed after nitrate of soda on wheat. It is also considered by many persons to strengthen the straw of cereal crops and prevents lodging of the crop before harvest. It also destroys slugs and snails and is distasteful to insect life generally. It in this respect resembles soot which is one of the best applications for land affected with these pests.—*Agricultural Gazette.*

The Plants of the Andamans.—Dr. David Prain, Curator of the Herbarium in the Royal Botanical Gardens, Seebpore, has been studying the growth of new plants "intentionally, accidentally, or naturally introduced" in the Andaman Islands since 1866. A list of the Andaman flora in 1866 recorded 520 indigenous species, and the number has since increased to 600, although four of the naturalised plants noted in 1866 have disappeared. A common Indian butterfly has made its appearance since the plant on which its larva feeds became naturalised.—*Pioneer.*

Grant of Land in the Eastern Lowcountry.—We hear that Messrs. W. Gow and Gordon Reeves have been applying for a grant of some thousands of acres of land in the lowcountry to the North-eastward of the Knuckles and Kalupahana range, near the junction of the Kalu and Amban gangas before they fall into the Mahaweliganga and we suppose not far off Polonnaruwa. Two young Surveyors are now busy blocking out in that neighbourhood. The soil is said to be very fine, the land flat with very heavy timber, though great parts have been chenaed. Rainfall is confined to tho North-East monsoon and there is a great deal of wind in the South-West. Tea would therefore scarcely flourish there, and it has not transpired what products are likely to be cultivated—perhaps tobacco and cotton. Should a grant be made on lease, there will be conditions as to cultivation, as well as about rent. The outlet would probably be via the North road, 20 miles off.

Detailed Estimates of Plantation Crops.—We have to thank planters in nearly every district in the island for the readiness with which they have responded to our request for approximate estimates of the outturn of tea, coffee, cocoa, cinchona, &c. during the current year. There are a few districts yet unrepresented in our bulky receipts, so that we must wait a week or two before beginning our analysis and compilation, to see how the results bear out the total estimates we have already put forward. We see our contemporary of the "Times" on the 5th instant arrived at the same figures for probable tea exports this year (namely 56,000,000 lb.) as we gave in our estimate on the 20th Jan., Mr. C. S. Armstrong independently sending us the same figures. We think it quite likely however, that Mr. Forbes Laurie's figure of 58,000,000 lb. may prove nearer the actual result.

MATERIALS FOR ROOF COVERING.

We have been asked to which of the several materials available for covering the roofs of residences in Ceylon, preference should be given if it were entirely a matter of choice. It must be admitted to be difficult to arrive at any decision such as would enable a positive answer to be given to such a question. The selection must be dependent on many varying conditions, chief among these being the character of the climate in which the residence might be situated. Such conditions as they exist between a lowcountry and an upcountry residence differ considerably, and even if a decision could be arrived at subject to such variance, there may be the further point to enter into calculation as to the resources of the district in which such residence may lie.

When writing some time back on the subject of the half-round tiles which are so largely used, we entered fully into the many objections to be taken against them. Theoretically, some authorities are of opinion that for very many reasons the flat roofs so largely employed throughout India and the East generally have much, owing to the character they possess of permanence, to recommend them over every other description of roofing. But, practically, these roofs are insufferably hot. There is no space between their flat surface exposed to a burning sun and the living rooms below in which a circulation of air may be maintained, and it is held that this disadvantage counterbalances every preference which may for other reasons be accorded to them. We may, therefore, for our present purpose, leave roofs of this character out of consideration.

But when we turn to other methods of covering our dwellings, we cannot decide upon one which is wholly free from objection. The objection taken in regard to half-round tiling, or, indeed, to earthen tiling of any description, has been dealt with on a previous occasion. Slate is far too costly a material to receive general adoption here; but many consider it is open to fewer objections than almost any other roofing. Slate is light, the thinness of it does not admit of the great retention of heat which is such an objection to earthenware tiles of any kind, and once fixed it is less likely to become disturbed than almost any other covering. Corrugated zinc is disapproved of from its heat-conducting properties, from its liability to corrosion when exposed to sea air, and, when used up in the hill country, to the intense cold it both accepts and transmits. The relatively large sheets also render it liable to stripping in the case of exceptional winds. Shingles, while admirable in many respects, are from their lightness and difficulty of fixing, also in some districts liable to take to partial flight during the same natural disturbing cause · but the difficulty now is to get a supply of really good shingles. Straw thatch would be perfect as a protection against either heat or cold, but it so rapidly decays as to need constant renewal, and in its dry state is liable to ignition and gives rise to dirt and the harbouring of vermin.

Many old colonists who have had experience all over the island consider that for the *acme* of comfort so long as it can be properly maintained, there is nothing like a well-made cadjan thatching. This is light and it is both warm or cool as occasion or circumstances require. But, unfortunately, it has no permanence, and is besides open to the objection expressed to straw-thatching, that of liability to take fire. The man who by a method of steeping in some chemical

igneous material could both obviate the liability and arrest the rapidity of decay in the plaited coconut leaves known as cadjans, would, in the opinion of very many, confer a special benefit on residents in tropical countries, and one too that ought to benefit the discoverer and patentee. It seems unfortunate that, with such an unlimited supply of the raw material as we possess in Ceylon, such means have as yet remained undiscovered. Who will be first in the field?

Meantime we are aware that on upcountry estates an experiment is being tried with shingles made of the giant bambu. The large stalks are split in two, the inside divisions are cleared away, the bambu is cut into proper lengths and these are tarred and fixed on the roof. In the earthquake region of Western Java houses are built entirely of bambu and roofed with plaited sections of *nipa* palm leaf, the *nipa* being the *ginpol* of the Sinhalese, known to the English as "the water coconut." The late Mr. Moens was much surprised, as well he might be, that the bambu was not more utilized in the construction of native houses in Ceylon than is actually the case.

Since writing the above we have received the opinion of a practical engineer of much local experience in favour of what are known as Mangalore tiles. He writes :—

"Undoubtedly the best all round material for the covering of roofs whether for the hill or low country is the Mangalore or Calicut tiles. These tiles are made of the best clay, are well burnt, of good shape and make, and just heavy enough to keep steady under pressure without the aid of weighting down. The Mangalore tiles are non-porous and weather-proof and maintain an even temperature: they are so cleanly made that ceilings are not required in ordinary rooms. As regards cost, the Mangalore tiled roofing with the woodwork complete costs about R4 per square over and above the cost for the ordinary half tiled roofing in Colombo. The tiles are more expensive per thousand, but there is a saving in timber in their favour.

"Many buildings have of recent years been covered with Mangalore tiles in and around Colombo, and their use is being gradually extended through agencies in Colombo and Kandy.

"The subject of material for roof-covering is one that should engage the attention of those interested in the Technical Institute. This interest might take a practical form by the introduction of improvements in the preparation of clay for the manufacture of tiles for roofing, as also in the preparation of caustic tiled pavements and terra cotta ornaments for architectural and decorative purposes.

"There is indeed in this direction a large field open to private enterprise, and really good material for the purposes abovenamed may be found at Seddawatte near Colombo, and at Katugastota and Gatembe near Kandy. All that is wanted is a knowledge of the preparation of the material and the aid of the newest plant, backed of course by capital, for developing an industry which would be apreciated throughout the island."

THE AUSTRALIAN SHE-OAK has been acclimatised in Aberdeenshire, and there seems every likelihood that it will prosper apace in that comparatively bleak quarter. The specimens which have so far flourished best on Dee-side have been produced from seed brought over from Tasmania, and the young saplings are reported to make headway at the rate of 18 inches a year. This is as much as they do at the Antipodes, and as the she-oak gives the best firewood the world produces it is to be hoped that its cultivation in the North may extend rapidly.—*E. Mail.*

CINCHONA BARK AND QUININE.

[ANNUAL REPORT BY C. E. BOEHRINGER & SÖHNE: WALDHOF NEAR MANNHEIM.]

Waldhof near Mannheim, 12th Jan., 1891.

QUININE.—At the beginning of the year just past manufacturers of quinine were occupied, even more than the rest of mankind, with the consequences of the influenza. The consumption of quinine during the period that the epidemic prevailed has been calculated at 3,000,000 oz. and that estimate is certainly rather below, than above the truth. We are moreover, of the opinion that since the period in question, the consumption of quinine in general, and especially in Europe has increased considerably. Probably those physicians who were about to relegate quinine to the category of obsolete medicines have since become of a quite different opinion.

During the first three quarters of the year 1890, the movements of the market were perfectly natural, and always the legitimate results of the situation. From 1s 2½d per oz. on the 1st. January, the price rose in consequence of the large demand during the months Jan.-February to 1s 3½d to 1s 4d per oz. and followed the decline of the epidemic during March-April by going back to 1s 2½d, oscillated during the quiet summer months between 1s and 1s 1d, and in August rose again in consequence of large orders from America to 1s 2d. Only in the last quarter of the year was the market "artificially" influenced: heavy forced sales depressed the price down to 12½d to 1s 1d first hand, and 11 to 11½d second hand.

PRICES OF SULPHATE OF QUININE.

On 1st Jan.			per oz	On 1st Jan.	per oz
1891	1s	to	1s 1d	1878	10s 4d
1890	1s 2½d	,,	1s 3d	1877	10s 10d
1889	1s 3½d	,,	1s 4d	1876	6s 7d
1888	2s	,,	2s 2d	1875	6s 4d
1887		,,	2s 3d	1874	9s
1886	2s 8d	,,	2s 9d	1873	7s 10d
1885		,,	4s 3d	1872	7s 8d
1884	7s	,,	7s 6d	1871	7s 4d
1883	6s 9d	,,	7s	1870	5s 8d
1882	9s 6d	,,	10s	1869	4s 9d
1881	10s 3d	,,	10s 6d	1868	4s 8d
1880	11s	,,	11s 6d	1822	40s
1879	12s				

Conditions in the producing countries remain subject to the same tendency already indicated by us. The cultivation of the Cinchona in Ceylon steadily decreases, and yields place to the planting of tea and other more profitable growths. The number of two year old Cinchona trees in Ceylon, that as recently as 1868, was reckoned at 70 millions, in 1886 had declined to 35 millions, and at present is estimated at only 19 millions. The falling off in last year's exports of bark from Ceylon compared with 1885-86 amounts to 6,670,000 lb. equivalent to about 2,250,000 oz. of sulphate of quinine.

Java on the other hand sends continually larger supplies of bark:

EXPORT OF BARK FROM JAVA
during the season from 1st July to 30th June.

		Amsterdam lb.			Amsterdam lb.
1889-90	abt.	4,750,000	1885-86	abt.	1,531,156
1888-89		4,415,000	1884-85		1,195,976
1887-88		3,492,913	1883-84		1,104,534
1886-87		2,230,276	1882-83		420,668

From 1st July 30th November.

		Amsterdam lb.			Amsterdam lb.
1890	abt.	2,450,000	1887	abt.	1,781,558
1889		2,019,086	1886		922,141
1888		1,825,273	1885		591,085

In the year 1869 the total export of cinchona bark from Java was only 700 A. lb. In respect to this product, the increasing importance of Java as compared with Ceylon, is further illustrated by a comparison of the London and Amsterdam public sales. The first auction at Amsterdam of 876 kilos of cinchona bark took place on 20th October 1870. Up to 1883 only one or two public sales of bark were held there annually, but since 1889 the number of Amsterdam auctions has risen to ten yearly.

PUBLIC SALES OF BARK IN LONDON.

1890	67,528 packages
1889	70,635 ,,
1888	90,470 ,,
1887	99,435 ,,

of which were sold

		oz. Sulph. Quinine.
1890	45,460 packages contg. abt.	4,020,000
1889	.. ..	,, 4,350,000

PUBLIC SALES OF BARK IN AMSTERDAM.

	packgs.	with abt. lb.	contg. abt. oz. Sulp. Quinine.
1890	39,636	7,196,000	4,250,000
1889	24,749	4 562,000	2,720,000
1888	18,216	3,158,000	1,880,000
1887		2,007,000	1,190,000
1886		1,439,000	858,000

of which were sold

1890 about 6,384,000 lb. contg. abt. 3,825,000 oz. Sulph. Quinine.

In point of fact therefore, as regards the quantity of quinine contained in the bark sold Amsterdam has almost placed itself on a par with the London market, and this year may very likely overtake it. It were however prudent not to indulge in any exaggerated speculations in this respect, since the outlook in cinchona cultivation in Java seems by no means so rosy as frequently described. The fact that the West Java Cinchona Cultivation Maatschappy has resolved to uproot about 2,000,000 cinchona trees on two of its four estates, suggests at all events the advisability of cautious judgment in the question.

The number of cinchona trees in Java is at present estimated at about 32 millions.

EXPORT FROM MALABAR COAST.

The supply of bark last year was smaller than in 1888-89.

From 1st July to 30th June.

	lb.		lb.
1889-90..	.. 1,833,522	1886 87..	.. 272,048
1888-89..	.. 2,218,700	1885-86..	.. 794,528
1887-88..	.. 1,070,160		

The decrease is very little due to local manufacture of quinine, since in the last year under report, only 234 lb. of quinine were made in the Government factories, and as before at a cost considerably greater than the price of the drug if bought in Europe.

Experiments carried on in India since 1886 have furnished proof of the interesting fact that by manuring the cinchona, its contents in quinine can be increased. The natural cinchona officinalis (11 year old trees) for example, which contains on an average only 3 per cent of quinine, under treatment with manure gave the following results:—

With lime and cattle manure	5.19 to 5.98 per cent
fish manure	5.94 ,, 6.82 ,,
bone-meal and cattle manure	5.35 ,, 5.97 ,,
bone-meal	4.95 ,,

With 21 year old trees (renewed bark).

fish manure	8.43 per cent
bone-meal	7.02 ,,

Mossed bark.		Natural bark.	
fish manure	5.97 per cent.	fish manure	5.54 per cent
bone-meal	7.02 ,,	bone-meal	6.85 ,,

The agents employed enrich the bark more especially of the fast growing Succirubras, Ledgers and Hybrids, and act more energetically upon younger than older trees.

BOLIVIA

sent last year a larger proportion of its high standard bark to Hamburg, viz. about 2,188 bales of about 70 lb. each. The London receipts were:

1890	5,574 bales.	1886	3,979 bales.
1889	7,552 do	1885	2 599 do
1888	7,810 do	1884	2,856 do
1887	7,190 do	1883	2,774 do

The cultivation of the Cinchona tree is becoming unprofitable also in Bolivia. The number of trees at present under cultivation is said to exceed 15 millions,

about two-thirds of them being in the province of Mapiri near the northern border whose business centre is Sorrato.

The export of Cinchona bark from the o'her South American states is inconsiderable.

EXPORT FROM MARACAIBO.

1889	195,750 lb.

EXPORTS FROM SAVANILLA.

1889	198,660 lb.
1888	385,836 lb.

JAMAICA.

has not yet realised the expectations entertained. The Government plantations yielded only:

1888	3,321 lb.
1887	17,000 „
1886	12,541 „

PRICE OF CINCHONA BARK IN LONDON.

on 1st January	1891	1⅜d to 1½d	per	unit
	1890	1¾d to 2 d	do	do
	1889	1⅝d to 1¾d	do	do
	1888	2¼d to 2½d	do	do
	1887	3¼d to 3½d	do	do
	1886	4½d to 5 d	do	do
	1885	6 d to 7 d	do	do

AVERAGE PERCENTAGE OF SULPHATE OF QUININE.

	1890.	1889.	1888.	
Ceylon Cinchona bark ...	2⅛	2⅛	2½	per cent.
East Indian	2	2	2½	do
Java	4	4⅛	4	do
Calisaya cultivated ..	4½	4½	4½	do

STOCKS IN LONDON show a considerablo decrease :

		pkgs.			pkgs.
31st Dec.	1890	48,213	31st Dec.	1886	62,350
	1889	57,181		1885	61,690
	1888	56,754		1884	80,500
	1887	59,619		1883	99,667

Estimated in English pounds :

	American	Java, Ceylon, Indian	Total.
1890	3,350,000	5,000,000	8,350,000
1889	4,126,059	5,700,960	9,827,019
1888	4,404,960	5,332,800	9,737,760
1887	5,174,365	4,485,600	9,659,965

Herewith is included a considerable quantity of bark unsuitable for manufacturing purposes. The percentage of the stocks of bark in London, on 31st December 1890, does not probably exceed 2,000,000 oz. sulphate of quinine. Regarding the quantity of quinine held at second band in London, opinions differ greatly. It is however supposed that the major portion is held firmly, and will be brought into the market only at considerably bigher rates. Stocks of bark and quinine elsewhere are unimportant.

The consnmption of quinine by the world in general is steadily inoreasing at the rate of abont 10 per cent per annum, and under normal conditions (without influenza) is estimated for the present year at about seven million ounces.

The large and constantly growing share of America in the general consnmption is best shown by the following fignres:

IMPORT OF QUININE IN NORTH AMERICA.

		oz.			oz.
1874	(fiscal year)	68,097	1882	(fiscal year)	794,495
1875	...	12,279	1883	...	1,055,764
1876	...	22,746	1884	...	1,263,732
1877	...	75 804	1885	...	1,390,126
1878	...	17,549	1886	...	1,251,556
1879	...	228,348	1887	...	2,180,157
1880	...	416,998	1888	...	1,603,936
1881	...	408,851	1889	...	2,825,008
			from 1st Jan. to 20th Dec. 1890		3,374,300

We herewith give a resumé of those statistics as are of chief importance, redneed to ounces of sulphate of quinine.

Export of bark from Ceylon		lb.			oz.
1890	abt.	8,800,000	c. 2⅛ per cent.	abt.	3,000,000
Export of bark from Java		lb.			oz.
1890	abt.	5,280,000	c. 4 per cent.	abt.	3,380,000
				Total	6,380,000 oz.

The supplies from the other exporting countries are about sufficient to cover the demand for druggist quills.

Stocks of bark in London	about	2,000,000 oz.
Consnmption in 1890	„	9,750,000 „
estimated „ „ 1891	„	7,000,000 „

With the help of the given data it will not be found difficult to form an opinion concerning the position of quinine.

COCAINE.—The profits of manufacturers, alike of crude cocaine and of the hydrochlorate, that were greatly reduced already in 1888, were still further curtailed last year. At times indeed, sales could only be effected at a loss to manufacturers, for whilst the high rates for coca leaves were fnlly maintained, the price of crude cocaine and hydrochlorate fell steadily still further from month to month. We referred already last July to the disproportion between the rates for raw material and the manufaotured article. Since then however the position has become greatly changed. Not only coca but also oocaine has risen very considerbly in price.

TEA PREPARATION IN CHINA.

It is rumoured, says a Foochow correspondent of the *North-China Herald*, that a few wealthy natives intend to purchase maohinery for preparing tea, and set up an establishment for that purpose in Kien-ning Fu. No charges, we understand, will be made to owners of tea for the first year, and thereafter the charge wil. be far less than the cost of manual labour. The idea is undoubtedly an excellent one, as many tea growers cannot purcbase such expensive machinery, and no doubt will be only too glad to avail themselves of an opportunity to have their teas manufactured in a better way than at present, especially if the cost would be, as is said, far less than hand labour. We sincerely hope that the promoters will carry the above plan through, when, we doubt not, many others will follow suit.

THE NON-KEEPING QUALITIES OF CEYLON TEA.

Some months ago our columns contained correspondence and discussion on the subject of the non keeping qualities of Ceylon tea, and the effect of long or short fermentation as the result. It was held by many that the longer the fermentation the longer would the tea keep its flavonr and condition, while the opposite theory was held by more than one experienced tea-taster, and, to test the matter as well as it could be tested, we obtained few samples of tea manufactured from the same roll but subjected to different periods of fermentation. One sample had only half-an-hour's fermentation ; another two hours' ; a third four hours' ; and a fourth six hours'. These four teas were tasted by Mr. Herbert Tarrant on the 29th of Angust, 1890, and he gave his opinion that the tea fermented for two hours was decidedly better than that fermented for balf-an-hour, and that that tea had better quality than the four hours' fermented tea, but was much inferior in strength. The six hours' fermented tea, he said, was much the worst. It should be stated that the length of fermentation was not known to Mr. Tarrant when tasting.

These samples were enclosed in lead and put in tin cases sealed and kept by us in a dry place till yesterday (so that they have been over five months in lead), when they were opened and again liquored. The result was that the half-hour fermented tea was declared to be much the best, having gone off least, and retained its flavor far the best. There was little to chcose between tho two hours' and four hours' fermented teas. Both had gone off about equally, whilst the six honrs' fermented tea bad gone off more than any of the others. The following is a tabulated statement of the result :—

Samples manufactured from leaf; medium plucking

elevation between 5,000 and 6,000 feet; good soft wither; rolled in Jackson's Excelsior; fired in Venetian; temperature during time of manufacture about 86°. After rolling half-hour small sifted out, and large leaf re-rolled another half-hour hard. Samples manufactured from same roll.

Tasted 29th August 1890.

		Order of Merit.
A.	Half-hour fermented	2nd
B.	Two hours	1st
C.	Four hours	3rd
D.	Six hours	4th

First in order of merit decidedly better than second. Second has much better quality and flavor than No. 3 but is much inferior in strength. Fourth is decidedly the worst.

(Signed) HERBERT TARRANT.

29th August 1890.

The above teas were opened on the 5th of February, 1891—five months afterwards, and the following is the report:—

A. Decidedly the best. Had gone off the least and still retained its flavor,

B. } Cannot separate these two teas. Both gone off
C. } a good deal.

D. Much the worst from every point of view. Had gone off altogether.

(Signed) HERBERT TARRANT.

—Local "Times."

THE KOLA-NUT TRADE.

At the Liverpool County Court before his honor, Judge Collier, Messrs. Broadbridge & Co., of Liverpool, general produce dealers, brought an action against Messrs. Thomas Christy & Co, London, drug importers, to recover the sum of 30*l* 10s 2d, the price of nine barrels of kola nuts which were sold by the plaintiffs to the defendants on November 17 last. Mr. Steel appeared for the plaintiffs and Mr. Pickford for the defendants.

Mr. Steel, in opening the case, put in letters and correspondence which had passed between the plaintiffs and defendants in reference to the kola nuts. The plaintiffs on November 7 wrote to the defendants, asking them if they were buying kola nuts, as they were brokers in Liverpool and their friends had some for sale. On November 12 defendants replied that they were buyers of kola nuts, if of good quality and reasonable price. Plaintiffs then sent samples of the nuts to the defendants, and stated that the owners would accept 6d per lb. The samples were sent on November 14th and on the 15th defendants agreed to purchase certain nine barrels. Defendants said that some of the barrels were not as good as the others, and for these they would give 5d per lb., and that if the offer was accepted, plaintiffs were to forward the lot to their address, but the plaintiffs were to examine each lot and see that there was no palm oil on the nuts. There was no palm oil on the nuts and on the 17th the barrels of kola nuts were sent. On receiving the nuts defendants wrote that they were not up to sample and were of an inferior quality. They offered to pay 4d per lb. for certain samples. Plaintiffs replied that their samples fairly represented the bulk, and they could take no reduction. Hence the dispute. Plaintiffs offered according to the conditions of sale of the General Brokers' Association, to leave the dispute to arbitration. Plaintiffs said they did not sell on "guaranteed sound," but "according to sample." They asked for payment of the nuts, as defendants would not have arbitration in the case. On Dec. 3rd defendants sent to the plaintiffs a cheque for 22*l* 4s 10d instead of the 30*l* 7s 10d which plaintiffs claimed. They returned the cheque. Defendants had now paid the 22*l* 4s 10d into court, and they claimed the sum of 1*l* 1s which they had paid in London to outside brokers to examine the kola nuts there.

George Frederick Howard, a member of the plaintiffs' firm, said: On Oct. 22nd we received a consignment of kola nuts, and sold this consignment as the brokers. The nuts came from the West Coast of Africa. When the steamer arrived the nuts were stored in Liverpool. They were unpacked and emptied out on the floor in bulk. Each lot was kept separate. On Nov. 12th I gave instructions to my warehouseman to take some samples. Three samples were taken and sent by my foreman to the defendants. I was not present when these samples were taken. I saw the large samples in our office which were brought from the warehouse. The largest sample from five barrels would be about 10 lb and the others much smaller. I examined the samples and found that those from five barrels were bright, clear, good kola nuts, and in good condition. Three barrels and a case were not so bright. The nuts in the five barrels were in a good condition, except a few. Some of them were mouldy and of a dark colour. Fresh kola nuts ought to be of a brightish colour. We cut the dark ones open to see if the damage extended, but found it only existed on the outside. The condition of the other lots was similar, but they had not such a bright appearance. They were of a redbrick colour. I did not see the small samples sent to London.

Cross-examined: We sold the nuts as brokers for the firm of Henty & Co. I have not a great experience of these kola nuts. I have sold them before, but not the fresh ones. This was the first lot of fresh ones we sold. I have seen three or four lots of fresh ones. My firm are general produce brokers. I never saw the bulk of the nuts. It is not customary to do so when goods are sold as samples. The warehouseman saw the nuts. After being stored the nuts were out of the barrels all the time. When sold they were repacked. The nuts were good lots. The firm did not sell on "guarantee sound," but on "sample." The firm knew that a few of the nuts were not sound. The sample was a fair sample of the bulk. The firm took a smaller price for the nuts because they were not so fresh as on arrival. It was true they were deteriorating and beginning to grow mouldy. I do not, however, think that they had deteriorated to the extent of 1*d.* per lb. When I received the complaint about the condition of the bulk sent to London I did not get them examined on my own behalf, as I desired the matter to go to arbitration. The arbitrators would then have had the samples examined. When I found the defendants would not arbitrate I thought it was no use for me to do anything in the matter. According to the rules of the General Produce Brokers' Association each side in a dispute could appoint an arbitrator. If one side neglected after three days' notice to do so, the Association could appoint one. The defendants sent down samples of what they said the bulk of the kola nuts were like. The arbitrators could have called for whatever samples they liked if appointed. Defendants had the nuts. I am not a member of the General Brokers' Association. I never named an arbitrator because the goods had gone from the firm's possession, and arbitration would have been no good. The defendants ignored everything, and it would have been no good, going on without them. The delay in selling the goods caused them to deteriorate to a slight extent. If they had been quickly sold they could have got 1d per lb. more.

Robert Taylor, the plaintiffs' warehouseman, corroborated the last witness's testimony. He also said the nuts were sampled by means of a spade. They were lifted by a spade into paper. A shovel was employed to get as fair a sample as they could. The general condition of the nuts was good, although some were not sound. The nuts were all mixed through when a sample was taken. After taking the large samples they were taken up to the office.

Cross-examined: I have seen many samples of kola nuts in different warehouses. I have seen fresh ones. The nuts were sampled after they had been lying on the floor for three days. I did not examine the nuts when I put them in the barrels again.

Re-examined by Mr. Steel:—The nuts were brought from the quay on Oct. 27th and were emptied on the floor a week after to keep them dry. The nuts would

be on the quay for about four days before they were removed.

Arthur Broadbridge, a salesman in the employ of the plaintiffs, said he took three samples of nuts on Nov. 12th from the bulk, and on the 14th took three samples from these for defendants. He put his hands in the centre of the pile to see if the smaller samples were as nearly as possible like the big sample retained. Some of the nuts were a little brown and rusty. There were only one or two mouldy ones. One of the marks of the goods were not so good as another.

Mr. Steel:—We took a less price for these.

Cross-examined:—The sample I took was a selected sample from a large sample. I was about ten minutes over it. If I had made a mistake the bulk would not have corresponded with the large sample. The plaintiffs' business was in fibre, oils, &c. He never saw the bulk of the nuts.

His Honor: Are the samples improved by handling?

Witness: No, sir.

Mr. Steel: If you rub a nut you improve its colour

Witness: Yes; but there was only a little mould on some. I took every pains to see that the small samples was similar to the large one.

This was the plaintiffs' case.

Mr. Pickford, for the defence, said he would call evidence to show that the nuts were not up to sample. He submitted that the only question was whether the deduction they had made was correct. Besides this, he failed to see how the plaintiffs who acted as brokers were entitled to sue as principals. The defendants knew more about kola nuts than anybody else in England. They had practically made the trade in kola nuts in this country. They had called in Messrs. Lambert & Strong, who had great experience in these nuts, to see the nuts. Mr. Lambert would tell them that the bulk of the nuts did not correspond with the sample.

The defendant, Thomas Christy, was called, and said: I have had nine or ten years' experience in kola nuts. Until a year ago all the kola nuts which came into Europe passed through my hands. I pointed out to the plaintiffs when they offered the nuts for sale that mouldy nuts were useless, and that I must have them fresh. The nuts are used medicinally, also for refining beer. The nuts prevent people going on drinking. (Laughter.)

Mr. Pickford: How does it do that?

Witness: It makes people nauseate. If a man is lying insensibly drunk on the floor, or under the table, and a nut were put into his mouth, in fifteen minutes the man would rise, and one would not know he had drink. He would not even have a headache. Even if within four or five days he went to take spirits again, the effects of the nut would still produce a nausea in his throat and mouth. (Laughter.) This was a well-known scientific fact. As the nuts are used medicinally, it is an important matter not to have them mouldy. The samples of nuts I received from the plaintiffs looked very nice. I was attracted by the nice appearance of the nuts, and I entered into negotiations for them. When the bulk came forward, I found they did not agree with the sample at all. The day after the nuts arrived I telegraphed repeatedly to the plaintiffs about them, in order to come to some arrangement. A kola nut, when once it becomes mouldy, changes its character, and becomes a fungus. They are then o no use. The bulk of the nuts were turned out in Mr. Lambert's presence, and they were wet, slimy, and mouldy in many instances. The keeping of the nuts a fortnight in the barrels would have a tendency to deteriorate them. The top of the barrels would be better than the bottom and centre. The nuts on examination had turned out not to be worth as much as the sum sent for them. I sent a letter to the plaintiffs to examine each bag as to their condition, and to see that there was no palm oil upon them.

Mr. Steel: There was none in fact.

Cross-examined: It was not until seven days ago, when the nuts came back from the drier, that I found that they were not of the value of Mr. Lambert's certificate. I know my solitors have paid the sum of 22*l* 4*s* 10*d* into court. I sent the mouldy nuts to the driers. Messrs. Lambert & Strong, when they examined the nuts, gave it as their opinion that the nuts were worth the amount certified. I could have bought nuts equal to the sample sent to me for 3d per lb. in London. I gave the higher price for the nuts in Liverpool because I wanted them for growing purposes. I send them all over the world. At the time I purchased the nuts I looked upon the plaintiffs as my brokers. The money I sent was returned. If kola nuts are bruised or expressed to the atmosphere any time they deteriorate.

Mr. Lambert (of the firm of Lambert & Strong, London) said he had examined the nuts at the request of the defendant, and gave him a certificate of the value. He thought he was called in by both sides as an arbitrator.

Some arguments by the counsel ensued, Mr Pickford maintaining that the plaintiffs were not entitled to sue, as the plaintiffs could not be brokers and principals at the same time.

Mr. Steel said that the defendants, in paying the money which had been returned to them, admitted that the plaintiffs were the right people to sue. Plaintiffs had the goods consigned to them for sale. He would ask his honor to say that there was no tender.

Mr. Pickford said the defence of tender was no good unless the money was paid into court.

Mr. Steel: The defendants having paid the money into court, we could not get it until there had been a judgment.

His Honor remarked that he thought the contention of Mr. Pickford about the plaintiffs not being able to sue came too late.

Mr. Pickford said that money which was paid into court was paid to the plaintiffs.

His Honor said he must take time to consider the question whether the plaintiffs were entitled to sue or not. He would also require time to consider the question of tender, and would therefore reserve judgment.

By permission of his honor plaintiff was recalled, and, in answer to Mr. Steel, said he received commission from Messrs. Henty & Co. of 1½ per cent for selling on their account.

His Honor: I will consider my judgment, and deliver it on a later day.

JUDGMENT.

(Delivered on Friday, Jan. 2, 1891.)

His Honor said: I find that the nuts delivered were not equal to sample, and that the sum of 23*l.* 5*s.* 10*d.* is the sum which the plaintiffs are entitled to recover. The tender of 22*l.* 4*s.* 10*d.* was, therefore, insufficient, and my judgment must be for the plaintiffs for 23*l.* 5*s.* 10*d.* But, except as to the costs paid into court, I direct that the judgment shall not carry costs, the defendants being practically successful in the action. A point was raised at the hearing, and left for my decision, as to whether the plaintiffs were entitled to recover at all from the defendants, inasmuch as they had acted as defendants' brokers in the transaction. This contention rested on a bought-note dated November 17, which was (so far as is material) in the following terms:—"We have this day bought for you the following goods. Customary allowances and Liverpool general-brokers' conditions of sale. Payment (before delivery if required), cash, in fourteen days, less 2½ per cent., brokerage 1 per cent. Signed, Broadbridge & Co." Prompted I suppose, by the desire to get a commission from both parties (for Mr. Howard admitted that he received commission from his selling principal), Messrs. Broadbridge were induced to represent themselves in this note as the brokers for Messrs. Christy & Co. If they were really so, of course they could not recover in this action, but I think that the correspondence shows that they were acting as

sellers' brokers, with an undisclosed principal; and, although they call themselves brokers, it would be more correct to describe them as factors. And the transaction, notwithstanding the bought-note, was, in my opinion, one of sale and purchase between the plaintiffs, who had possession of the goods, and the defendants; and the defendants, after having received the bought-note, took the same view, for they tendered the 22*l*. 4*s*. 10*d*. I think, therefore, that the plaintiffs are not precluded on this ground from recovering.—*Chemist and Druggist.*

THE BUSINESS OF BROKERS.

Litigiousness is not the prominent characteristic of the fraternity of brokers of our day—at least, not of those whose dealings are chiefly in drugs. Very rarely do we have the opportunity of learning anything about the law which governs their transactions from the conclusive test of a contest in the courts. The case tried before the County Court judge at Liverpool, the report of which we give above, seemed at one time likely to afford an opportunity for a display of ingenious legal lore, and we are a little disappointed that his Honour of that court should have contented himself with so ingeniously gliding round the difficulty which had been raised, in the somewhat uninteresting judgment which we have to record. Whether the sellers and the buyers of the kola nuts in question are equally satisfied, or equally dissatisfied, we do not know; their dispute was not a very imposing one, and onlookers are likely to come to the conclusion that the decision is a practically just one. But, out of curiosity, we should have been pleased to have had a judicial essay on the interesting point submitted to the court whether the brokers, taking as they did, and as is usual in their business a commission from both buyer and seller, were in a position to sue one of the parties as if they were principals. We suppose the custom of the double percentage is so well established, and so universally understood, that there can be no question of its legality for brokers; but there are plenty of cases from which it may be gathered that such a system is scarcely permissible to other persons acting in a fiduciary capacity.

In Judge Collier's view, the plantiffs in the case reported were to be regarded rather as factors than as brokers. If they were such, they had an undoubted right to sue. But the bought note, in which they expressly held themselves out as the agents, for the buyers, was inconsistent with their legal standing as factors, and had to be regarded with amiable charity by the learned judge. The truth is that the broker's business, as it is now conducted, is not very clearly defined. To a considerable extent it is governed by the Factors Act, 1889, but the generally-understood distinction between factors and brokers is, that factors have possession of the goods they sell, and that brokers have not. When they are not factors in the legal sense, they are simply mercantile agents, and are subject to the ordinary laws, even if these should clash with their own carefully-devised rules and conditions. Until the Act of 14, brokers in the City of London were under the control of the Corporation, and were liable to a penalty if they assumed the title. They bound themselves by oath to a certain course of conduct, one stipulation being that they should not buy and sell merchandise on their own account. The Corporation did not rigidly enforce its rights, took fees from those willing to pay them, and generally left others alone. The Brokers Act of 1884, by abolishing the control of the City authorities, removed the restrictions on the business as well as on the title.

Brokers have a rather mixed record in our history. The name seems to have come into use in England first in the fourteenth century, and from then on to the sixteenth century the middlemen in trade were called brokers, broggers, and brocars promiscuously. Broggers are mentioned in a statue of Richard II., which requires that they shall not practise as such in any mystery except they be chosen by such mystery. The name is said to have descendend from the Norman-French "brokier," and that from the old French "brochier," which meant one who tapped or broached wine. The modern dealers in "wine from the wood" are the original and most genuine of brokers. But as foreign trade grew, and imports from foreign countries became more abundant, the men who found customers for the cargoes reaching our ports became by far the richest and most highly-esteemed of the various kinds of brokers. The business was a very important one in the early part of the seventeenth century, and great was the jealousy between the English brokers and the "sonnes of Aliens" who competed with them. In the Guildhall Library there is preserved a curious "petition of English brokers lawfully admitted to deale betweene marchants in London" to the House of Commons of the year 1620. It humbly sheweth "That for many ages past it was the use and custome of the Cittie of London that none but freemen of the Cittie being Englishmen borne and householders should be admitted to exercise the trade of a Broker between Marchant and Marchant, whereby great commodity did arise to the common wealth for many years together." But now "in these dayes many strangers borne and the sonnes of aliens and others not lawfully admitted doe use and exercise Brocage between Marchants, by which means many intolerable and insupportable mischiefs do daylie happe unto this Kingdom and State." Among the inconveniences enumerated from the conduct of these strangers and sonnes of aliens were that not only in London, but also "in Exeter, Norwich, Colchester, Canterbury, Sandwich, and many other places," they were buying and selling "both in grosse and by retaile, . . . driving a wonderfull home trade in this realme, to their private inriching and impoverishment of the English borne subjects." They were said to seek only "the profit of the Marchant strangers, and how to sell his commodities at the uttermost price." Thus they "inhaunced" the value of commodities. Other reasons given to their discredit were that they probably melted down the bullion they obtained and sent it abroad, and that through them the dealings of the Englishe could not be kept secret.

"The Act against Brokers" passed in the reign of James I., and still in force, reflects in its curious phraseology another grievance which the artistocratic brokers seem to have entertained. They evidently did not approve of Dick, Tom, and Harry calling themselves by the title which they had made honourable. "For as much as," declares this statute, "of long and ancient Time, by the divers hundred years there have been used within the city of London and Liberties thereof, certain Freemen of the City, selected out of the Companies and Mysteries whereof they are free and members and the same persons to be presented by at least six approved and known Honest persons of the same Mystery to the Lord Mayor of London for the Time being, and to the Aldermen his brethren, and to be recommended by such Presentors to be persons for their known Honesty, Integrity, and Faithfulness, Persons meet for to be Broker or Brokers." These "having taken their corporal Oaths before the said Lord Mayor and Aldermen to use and demean themselves uprightly and faithfully between Merchant English and Merchant Strangers

and Tradesmen in the contriving, making and concluding Bargains and Contracts to be made between them concerning their Wares and Merchandizes to be brought and sold and contracted for within the City of London." These persons, the Act goes on recite, "have had and born the name of Brokers, and been known, called, and taken for Brokers, and dealing in Brokerage or Brokery," and they "never of any ancient Time used to buy and sell Garments, Household Stuff," and suchlike. But, the Act goes on to deduce that, "certain Freemen of the City had forsaken their manual occupations, and did daily set up a Trade of buying and selling and taking to Pawn all kind of Worn Apparel, finding that the same is a more idle and easier kind of Trade of Living." These brokers of the baser sort are described as "Friperers and no Brokers," and elsewhere as "upstart Brokers," and they have been found to encourage "bad and lewd persons to rob and steal." The Act does not, as the reader would anticipate from its preamble, make any provision for the protection of the title. Its object is simply to impose a fine on those objectionable furniture and apparel brokers who should receive stolen goods.

That class of dealers had been called brokers for "divers hundreds of years" before King James's day, and the name and occupation still survive among us. In a sense, it will be seen, all middlemen are brokers. Those whose original business was "the contriving, making, and concluding Bargains and Contracts between Merchant English and Strangers," still tend to become merchants themselves, as they did two or three centuries ago, but the middleman or broker would seem to be as necessary now as he was then in various departments of our commerce, notwithstanding the alleged disposition of the age to crush him out. —*Chemist and Druggist.*

SISAL HEMP.

The following detailed particulars of planting, working, general management and final out turn of Sisal Hemp (of commerce) were written in 1886 by Mr. Daniel J. Stoddart, a well known resident of Jamaica:—

INTRODUCTION.

In putting the present work of Sisal Hemp planting into print, and introducing it to the public of Jamaica, I do so with the object of promoting, if possible, the interests of this Island by advising the cultivation of the plant, considering it nothing less than an obligation of mine. I shall endeavour to put before my readers the planting, working, and everything else connected with Sisal Hemp in as few words possible, and yet in as explicit a manner as to be fully comprehensible. When I first landed on the shores of that great hemp country Yucatan, one of the States of Mexico, and saw the immense trade in hemp, by which a large amount of money is put in circulation, and the fibre finding such an immediate sale all over Europe, but principally in the United States of America, the demand being so great, it attracted very much my notice and consequently claimed my attention which I immediately gave.

The importance of this fibre may be judged when it is known as the sole production of Yucatan and the only article of export.

Too much cannot be said of this valuable plant which is the great and only source of wealth on the Peninsula where there are to be seen plantations of pure hemp, comprising each an area of about two thousand acres. The increasing demand for it all over the world is made manifest by the number of new plantations being opened out there. There is no doubt that there are soils in Jamaica highly adapted to the cultivation of Sisal Hemp, and that the climate is identical with the tropical nature of Yucatan. What makes me more sanguine about its success here is that some time ago I brought out a few of the very young plants, distributed them to friends who planted them, and they are to be seen now growing beautifully and sending out suckers.

My practical experience in Yucatan and day and night work in connection with this hemp, having been in the working and management of it myself, enable me to write fully on the matter. This small pamphlet is specially dedicated to Jamaica, with the hope that those into whose hands it may fall will lose no time in taking up the matter and starting the cultivation. As far as its profit is concerned, putting the expenses at the extreme and the fibre at the lowest price in New York, of 4¼ cents a pound, Sisal Hemp gives a return of about 75 per cent.

In a part of this book will be found a complete statement of the cost of working, out-turn and details of production, &c. An important point is that a plantation of hundreds of acres producing a good deal for a year's crop requires only a small "plant of machinery," as well as buildings, &c. I speak comparatively. The market for this fibre is already well established; it does not therefore need any introduction but must meet with a ready sale. I do warmly and faithfully recommend the planting of this hemp as a safe and sure investment, there being nothing that can properly be called *risk* in its culture. Several times I have advocated in the papers the cultivation of Sisal Hemp, but space prevented me giving a minute description of it. To remedy this and so as to have the public impressed with the value of it I have selected this medium, wherein is to be seen all the details, which I trust will prove of some interest to my readers, who I have no doubt will agree with me in saying that the establishment of plantations of this sort in our Island will be a fair stride in her agriculture.

CHAPTER I.

DESCRIPTION OF THE PLANT.

The Sisal Hemp plant of Yucatan, Agave Itxli or Henequen, as it is called there, would in its first appearance resemble our "Keratto," but upon close observation will be found widely different, being of a distinct style of growth; the leaves not growing out so near each other and of a light green, exceedingly thick. For this reason they give so much fibre which for strength exceeds all others. The leaves of the plant, which grow with prickles or thorns on the edges, the thickness of which is greatest at the ends, where they are joined to the tree and tapers off towards the edges and other ends which have hard and sharp points, are slightly gutter formed; they grow first upright, shutting up into one another, then gradually spread open, and finally bend down around the tree.

The hard nature of this plant, which is almost incredible, proves itself beyond a doubt, insomuch that if rooted up it will remain alive for weeks without being replanted.

There is positively no failure in it as with or without rain, good or bad weather, it grows and flourishes and never dies. It is a "semper virent" in every sense of the word, and in my estimation can have no equal in its life-lasting quality.

For a proof of this I have known during my stay in Yucatan, when it only rained one month in the year, just a few showers, and the remaining eleven months pure dry weather, that the cattle died of starvation; yet, during all that time the plant remained perfectly intact, not the slightest failure—not the least affected by the drought, retaining its greenness, giving its return of every day cutting and working, and as a fact producing more fibre, throwing out less bagasse, and all this in a country devoid of rivers and streams.

Neither ploughing nor manuring of land is required for the cultivation of this hemp plant: no animal of any kind eats it.

When the fields have arrived to "cutting age" and the work once begun there is no "out of crop" but a perpetual work all the year round.

The plant lasts according to the best authorities for at least 25 years in cutting state, pending on the soil and treatment.

It takes at most three years after being planted to arrive to its cutting state. At this stage and onwards during its existence the more a plant is cut the better it thrives, the more leaves it throws out; while if it were to be left uncut it would, in a short time, growing until it finds no other vent, send out a pole from the centre, the appearance of which determines its death although young, and do what you may it ultimately dies,—singularly strange, but really true, so that the greatest caution is to be observed as soon as it reaches this state, which will be found fully explained in the chapter on cutting, &c.

After it reaches the age of 12 months it will, if planted in the proper manner, begin to send out around its root young shoots or suckers; and when it arrives to the age of cutting, innumerable quantities of them, so that when there is no place to be planted they have to be cut off and thrown away, the field not admitting of any more plants than those already set out, and more than that, if these shoots are allowed to remain they greatly injure the mother plant by taking from it the nourishment it needs. Inasmuch as I make these remarks my readers must not for a moment think it a delicate plant; on the contrary, naturally with care it will turn to better account.

To replenish a field it would only be necessary when, after a number of years, the mother plants show signs of fading, to plant at the proper distances, by the sides of the old plants or between them young shoots which three years after and upon the failure of the old ones will be fit for cutting, when a new field will be up without any loss of time or suspension of work. This is undoubtedly the practice carried on in Yucatan, and a very good one, there being no necessity of new lands for the fresh planting, as the old fields suit admirably and give good results.

Old worked lands are known to give the best yield.

CHAPTER II.

THE DIFFERENT SPECIES OF HEMP PLANTS.

There are in Yucatan seven classes of hemp plants with indigenous names, which they retain to the present day. It may not be out of place and uninteresting to give a description of each of them. The following are their names; Sacqui, Cbelem, Yaxqui, Chuchumqui, Babqui, Quitamqui and Cajum. In the first place is considered Sacqui; this name, according to the Indian dialect, signifies white, not by its fibre being white, but because the greenness of the plant is lighter than any other. This class of hemp plant is the one that has been attended to in its propagation on account of all its good qualities, and of which chiefly the plantations consist, forming the article of export in the raw as well as manufactured state and giving all that is desired, viz., abundance, flexibility, whiteness, strength, length and weight. The second Chelem, partly wild, is found in abundance in the woods and is productive. It is held to be of good quality because its fibre is white and strong. Yaxqui takes the third place; this has short leaves, gives a small quantity of filament which is soft, fine and strong. The fourth class, Chuchumqui, is much like the Sacqui, with the difference that its leaves are harder and thicker and its fibre coarser and less flexible, which makes it unacceptable.

The fifth class called Babqui has leaves which produce a small quantity of fibre although of good quality. In the sixth place is considered Quitamqui of short thin leaves, producing little fibre, through which it is not appreciated.

In the seventh and last class stands Cajum; this has long leaves, very delicate, of pallid colour and lives a small quantity of fibre.

To return to our object: the first class Sacqui, which this work relates to and treates of entirely, is what claims our attention; it is the plant we look for, the one we want, having in it both quantity and quality, and all otherwise that renders it acceptable and worthy of cultivation. The application of the word "Sisal" to this hemp, by which it is known and called, is derived from a port of Yucatan of that name, whence it used to be shipped formerly, but which has been abandoned for the other port of Progresso, where the total shipping of that State is now carried on.

CHAPTER III.

THE SORT OF LAND AND THE PREPARATION OF IT.

For the cultivation of this plant due regard should be paid to the selection of the lands as well as the locality, Gravelly, stony and rocky lands are most appropriate, also any other dry and impoverished soil. Swampy land would be very unsuitable as it keeps unabsorbed a large amount of water. Sisal Hemp planted on rocky lands is perfectly at home and will astonish any one to know how it survived and grew. There is no objection whatever to the poorest land or those worked for many years, even lands that are considered ruined by continual fibres, such as our savannahs.

These are quite suitable for the plant, provided they do not keep water on them very long.

Sugar estates recently thrown out of cultivation are unfit from the manure which renders the land rich, as the consequences would be that the plants grow rapidly, give a large leaf, but produce no fibre. The same would, I consider, apply to the very cool mountain climate of Jamaica where it might grow, but give little or no fibre.

It requires all the heat possible to give good results. It would be necessary in the selection of the lands to have level ones as near as possible, which will admit of the easy and cheap carriage of the leaves from the field to the machine.

The Preparation of the Land.—Of this no consideration needs be taken apart from having the land cleaned up and fenced, ploughing and manuring not coming in the way at all.

After the selection of the land has been made, proceed in the month of June or July, as is customary in Jamaica, to cut down and clean it up, taking care to have the trees cut as close to the earth as is possible, leaving in this way very short stumps, giving room to the play the leaves ought to have. The stumps should be burnt out or taken out somehow, so as to create regularity in the planting; all this should be done and the land made clean to meet the month of September, which generally brings much rain; if a return of very high weed give it a cleaning and so have it prepared for the reception of the plants as this will be the opportune time to put them in, taking advantage of the seasons to make a good start, all the plants being provided in their nursery beforehand.

The land for the planting of Sisal Hemp must be entirely free from all shade as the plant requires very much the aid of the sun to forward its growth and give the necessary result; it would not thrive if shaded, the more heat the more fibre it turns out there being less bagasse.

It may be planted any month of the year, but it is wiser to do so during rainy seasons, for the plants getting a fair start will not be retarded so much in their growth as they would otherwise and consequently will give a return far sooner.

Fences are only required when the plants are young, as being diminutive they would be trampled or knocked out their holes, but so soon as they pass that condition fencing becomes more a luxury than a necessity, the reason of which (already said) is that no animal molests the plant, rather keeping away from it.

CHAPTER IV.

THE YOUNG PLANTS, THEIR SELECTION, THE NURSERY FOR THEIR FIRST RECEPTION, FIELD PLANTING.

In obtaining the young plants the younger they can be got the better it will be, as they grow much more

rapidly and arrive to maturity earlier; on the other hand they should not exceed 25 or 26 inches in height, for these reasons, that they are more productive, being quicker in giving suckers or shoots and a great number of them at the same time growing with more vigor.

If the field be not ready at the time of receiving the plants, the cultivator must immediately establish a nursery for them, which consists in getting a piece of soft land or digging up for the purpose and securing it with a fence; this place must be free of all shade, as this would injure seriously the plant which requires all the exposure to the sun.

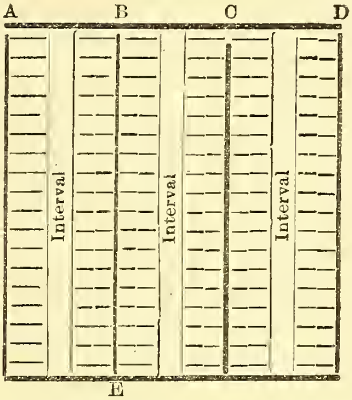
In getting the plants it is precisely necessary that their main roots remain on them as being for transportation; they will by this retain their verdure for a long time. In the nursery they must be planted at the distance of 18 inches apart, which makes about nineteen thousand suckers to the acre, and in the following manner: first take off the dry leaves, then cut the main roots clean off and pare as closely to the trunks as possibly all round without injuring them, nor so deep as to allow the leaves to fall off; after this place them in the ground perpendicularly, putting in and covering only the inferior parts of the trunks dirt; all this care and attention in their infancy is the way of having quick returns, and although they be not yet planted in the field still they merit this attention which will amply repay the planter, as they lose no time in developing while in the nursery, which is an advancement in their growth and when transplanted in the field become ripe sooner, whereas if thoughtlessly cast aside to await field planting will naturally be very much kept back.

Field Planting.—The idea of taking advantage of the land in setting out a great number of plants has been carried in some cases to such an extent in Yucatan as to be prejudicial not alone in the plants not developing fully but for the material difficulty which is presented in the culture and exploration of them when they are grown up, as the leaves of one plant meeting those of another stop with their sharp points the passage between them, preventing easy approach to the trunks, a thing absolutely necessary for cleaning the field and removing the shoots destined to the reproduction.

The general system now in planting is 12 by 6, *i.e.*, the rows twelve feet wide and the plants six feet apart in the rows which leaves clear passages of 12 feet between the rows, thereby giving sufficient room with facility for the inspection of them and for the pasturage of cattle and horsekind, and spaces of 6 feet between the plants which permit the easy approach to the trunks for weeding and getting out the shoots that spring at foot of plant; experience has proved this the best mode of planting; it also allows the free penetration of the heat of the sun whose effects on the plant are wonderful. The above distances give six hundred and five (605) plants to the acre. Now, after having the field perfectly clean and ready, open the holes for the reception of the plants by first stretching a line with the distances marked off, or it may be pegged out as the cultivator likes, so that it be straight and regular, which must give it a fine view.

The holes to be made can be dug with a hoe or common digger, and must be about as large enough to receive only the lower parts of the trunks of the plants which should be put in a perpendicular manner and the dirt drawn around, leaving exposed as much of the trunks possible which accelerates their growth. The plant must, however, after being taken from the nursery and prior to setting out in the field be pared off end, if found necessary, which will be in the case of any roots sprigging out during its stay in the nursery, must be cut off. It ought to be treated in exactly the same manner as when it was being planted in nursery, which is already explained; it is wonderful to know the advantage it gains by this treatment; it is not too much when I say it puts on a year's growth to what it would have otherwise.

As the spaces above would not be sufficiently wide for the carts to go into without injuring the leaves, it is therefore necessary to have wider ones or intervals where they may take up to carry to the machine the leaves which are put at those intervals by the cutters; the intervals ought to be wide enough to admit of two carts passing each other freely. For ease to the cutter, as well as convenience and economy to the planter, I suggest a plan of laying out a field of say 31½ chains square, as the following figure shows:—



The field is divided into three sections, each of which measures 10½ chains, and is represented as follows:—

A to B first section, B to C second section, C to D third section; in the middle of each runs an interval of proper width having a depth on either side within each section of about five chains. The short lines drawn across indicate the rows of hemp between which the cutter works, and therefore has—while cutting in any section— a distance of not more than five chains to carry the leaves to the interval, where the cart gets loaded. Each section has its boundary line as is shown from B to E.

It will be found, if this plan is adopted, how much the carriage of leaves is facilitated, being done quickly to the great interest of the cultivator.

Cost of paring roots and planting suckers in the field.—They are pared at the rate of one penny half-penny per 100, by which a boy or woman can earn a shilling to one shilling and threepence per day, as one person will pare easily 1,000 plants for the day.

It is worth about four shillings and sixpence per acre (605 plants) or ninepence per 100 to line out, dig holes, drop suckers and plant. One man and a boy can plant at least 300 suckers (½ acre) per day which will give them two shillings and threepence, the boy to assist stretching the line and to drop the plants, one to each hole.

If the suckers are planted in the correct manner there will hardly be any supplying required. I have seen thousands planted, have planted them myself without one failing; more than this, I will at any time guarantee to plant five hundred thousand suckers without the loss of a single one.

CHAPTER V.

AFTER CULTURE, OTHER PLANTS IN FIELD, POLE.

The after culture consists first in attending to the plants in the field and keeping them free from weed.

The number of times a field ought to be cleaned in a year cannot be determined; if the planter wishes to obtain all the results possible he should stick to the rule that "the field be constantly kept in a state of cleanness;" it is not altogether requisite to clean the field when the weeds are below the level of the plants, as at that height they do little or no harm, but they should never be allowed to be on the same height or reach above them. The plant is never moulded in Yucatan; it is considered there that ploughing and moulding (where admissible) would prevent it generating as it ought. In my experience I know as a fact that the less soft the earth the sooner it produces shoots.

Next, the young suckers or shoots that may grow around the mother plant ought to be taken away early for planting other fields; if not required they should still be cut off and thrown away; if they remain they become hurtful, as they take in the nutriment which the mother plant requires and should have.

In my opinion there would not be any necessity of resorting to the destruction of the plants, for if once started here the owners of plantations would find customers for the purchase of as many as their fields would be capable of turning out.

The purchaser must not at that time forget to take the necessary precautions as are already advised and explained in subjecting the suckers to *Nursery treatment* if the field be not ready to receive them.

There being wide space anything of low growth may be planted in the field up to harvesting which will not choke the plants. I must again advise my readers not to cultivate what will spring above the hemp, for that would keep back the plants.

Pole.—The sign of the termination of the existence of a Sisal Hemp plant is when it sends out a pole from the middle; this happens when the plant arrives to cutting age and the leaves are not cut, for notwithstanding its youth it dies, or in the other case where the tree attains old age, then it is natural. If this pole were allowed to grow it would reach a height of from 12 to 18 feet; in the upper part it throws forth branches with flowers. When the pole begins to come out and gains a length of about 3 or 4 feet is the customary time to cut it off close to the body of the tree without injuring the leaves, which will be matured and taken off before the plant dies altogether; the practice of cutting the pole is to prevent it from flowering, as it is thought that its flowers are injurious to the young shoots at foot of mother plant. In the plant of quick growth the pole, immediately after it comes out, begins to send out small suckers similar to those produced around the root, only very diminutive, but these are of no great value, and if planted would cause a degeneracy; producing none, or if any, very few shoots although they may grow well as plants. This chapter ought not to be closed without recording that apart from the shoots which grow around the root of the plant and those which the pole produces Sisal Hemp possesses another medium of reproduction, and this is in its seeds. These may be found in large quantities in the bauging capsules of the superior ramifications of the pole (when this is allowed to grow) and if they are gathered in a ripe state and dried may be sown in the same manner as any other seed, and it is believed that small plants would be obtained equal to those which are got in the usual manner. I do not doubt the fruitfulness of the seed as, although I have not personally experimented on it, old planters who are reliable authorities assured me that they have been sown and afterwards planted with good results. I mention this merely to show the different ways this hemp is produced, as industriouly speaking it would not be of great utility to have recourse to this mode of reproduction when nature has given a style more rapid and efficacious and consequently more adapted to the exigency of its growth.

CHAPTER VI.

HARVESTING OF THE LEAVES, TOOL USED FOR CUTTING, CARRIAGE FROM THE FIELD.

We now arrive to a point which is to show us when the leaves are fit for the machine to extract the fibre, a thing of great importance. For the harvesting of the leaves we must take into account first their length, second their ripeness.

1st. *The Length.*—The length of the leaf matters a good deal as fibre of this class (Sisal Hemp) is only admitted into the market and rendered saleable when it has a length of at least three feet; the leaf generally with good cultivation reaches the proper length at the age of three years and on quick soil before this; the leaf increases in length as the plant increases in years. I have seen fibre 4 feet 6 inches long from hemp a few years old.

The determined length therefore of the leaf as it stands on the tree should not be less than 3 feet, in order that after trimming off its sharp point it may turn out the fibre to the least desired length; this is an invariable rule and of primary importance. I am certain the plant will attain this in Jamaica earlier than it does in Yucatan, thereby yielding its profits sooner.

2nd. *The Ripeness.*—This consists in (A) its position on the tree, and (B) its color, chiefly the former.

(A.) *Its Position on the Tree.*—So soon as the leaf which at first grew upright and afterwards inclined downwards, getting longer during that time, reaches a horizontal from the trunk it may be considered ripe and be at once cut. After it moves from this position towards the earth it grows no longer but begins to shrivel and after its point touches the earth it decays. If allowed to reach this state and cut it will be found after extraction to contain a spotted fibre and less quantity than a ripe leaf; the result of an unripe leaf would be similar in producing less fibre with the exception of not being spotted.

(B.) *The Color.*—The natural color of the leaf is a light green, and this on the leaf maturing will change to a dark green which is easily perceptible and which on the leaf reaching the ripe position, as already mentioned, will show up fully, confirming at once without going any further the truth of the leaf's ripeness. The above description of the length and ripeness of the leaf does not imply that it contained no fibre before this time, quite the opposite, it had all the time, and were a fibre of short length marketable could have been started upon twelve or fifteen months after planting by, course cutting those leaves which are really ripe. From its infancy the leaves are continually falling down and dropping off, given place to the new ones which grow out.

The knife for cutting the leaves from the tree must be of a half round form in the shape of a scythe or grass knife, but of less diameter, therefore smaller, with a short hollow handle to admit of a wooden one, of good length, necessary to reach to the trunk of the plant: and appreciated for its lightness; the knife deserves to be of good steel and kept sharp to give a clean cut and facilitate the cutter.

To cut the leaf in the proper manner the cutter must put himself in such a position as to face the leaf from the side, the last or bottom leaf ought to be cut first so as to prevent any injury to the fibre from the knife slipping and cutting into the next leaf, which would be the case if the top ones were cut first. The knife must be started on the leaf from one side or edge and drawn across, and it will be found to come off freely and nicely. The greatest caution must be observed to cut the leaf as close as possible to the trunk of the tree; neglecting this important duty will end in losses; first, the leaf not cut closely would lose a small quantity of fibre; that arrives to a good deal in many thousands; second, if the stump of the leaf where disunited be any length from the trunk it injures seriously the tree, spoils its vigor and makes its existence a short one.

Immediately after the leaf is cut and before taken away the prickles on both edges a'so the sharp point at the end must be trimmed off, which can be done with a small cutlass or large butcher knife, but so carefully as not to trespass on the limits of the valuable leaf, barely taking them off. This operation is very necessary for the easy manipulation of the leaves in the field and at the machine. The leaves must now be made up in bundles—head and tail alternately—of 50 or 100, as the cultivator may think fit; this is necessary to count easily and rapidly on receiving from cutters and delivering to operators at the machine, all of whom are paid by the thousand; the bundle of 50 is, I think, more suitable, being of less weight, and the right one of about 75 lb. rendering it handy as well as giving ease to the cutters, cartmen and others, more so the first of these who have to carry it from the rows where cut to the interval.

A dray on good road carries 1,500 leaves at once to the works. Care must be taken to inspect the cutting or the cutter may, to suit himself, cut down green as

well as ripe leaves to avoid too much trouable and make a large profit in a short time.

I must at once take the opportunity of advising my readers as to their close application now. This is the time when if the plant is neglected and the leaves not cut it sends out the pole, the appearance of which, as you are already aware, sea's its doom to the sad loss of the cultivator who, after he is sensible of its value, will in no way relish it. Here begins the constant work which is justly so since there is no stoppage as crop goes on from one year's end to another. The proof of this is that a field or plantation started upon cutting at one end will, before the other end is reached, be ready to start over again, and this, too, whether rainy or dry weather; great attention is now required so as not to loose the leaves after cutting nor tho filament after extraction. At this time there ought to be a very large number of young shoots around the plants which may bo taken away to supply other fields.

CHAPTER VII.

MACHINERY, DRYING STAND, PRESS AND BUILDINGS.

To begin there must be on the spot or as near as possible a good and never failing supply of water for the use of the engine and otherwise. In the selection of the engine it of course depends on the number of acres in cultivation to form the calculation. If the plantation consists of 100 acres it requires an engine of 1 or 1½ horse power to drive the fibre-extracting machine; one fibre machine is allowed to every hundred acres to be driven direct from the engine. There is no actual necessity of my describing the fibre extracting machine of Yucatan when we can have a superior one of modern style, which will suit the work splendidly, and I am sure turn out the fibre to better advantage, creating less waste. I will now give the details of the position, &c. Sufficient space must be allowed between the engine and the cleaning machine to admit of the reception of the leaves on the stand which is fixed not faroff the machine, as well as to give room to the operators who take their position there. The machine, which is connected to the engino by means of a driving belt, is made to take a backward motion towards the engine and operators, which must necessarily be so in order that the leaves on being inserted find their way downwards, the retuse or bagasse going under and emptying itself outside. The place where the machine is to be situated ought to have a certain elevation above the general level of the ground for facilitating the descent of the juice of the leaves and of the water which serves for the washing down, by means of natural or artificial declivities which conduct it to the deposits where it ought to be absorbed by the earth, or naturally evaporated by the action of the sun, from a neglect of which I have known many farms to present a disagreeable aspect all round. It is very important that the works be easily accessible to drays by having good roads, through which the work of carting in leaves, bringing in fuel, and carrying away the bagasse, &c., can be easily and quickly done, as on the good operation of these depend in great part the punctuality and exactness of a work like this, which requires the utmost persistence and entails loss in the least mismanagement, as well as for its choapness and the final out-turn of the business. The exposure of the building necessary to the machine should not be treated with indifference; on it is dependandent that the operators be not disturbed by the direct embracing rays of the sun, and to avoid this it is best to make this building face the north as they will not be free from the sun, but the ventilation would be as perfect as possible; if not convenient to get it to face the north adopt in preference the east, so as to participate of the advantage enunciated, avoiding the south and west which would be insupportable for the operators in certain seasons of the year. It ought not to be lost sight of that the rule in Yucatan is that immediately after the day's work the fibre extracting machines are well washed and cleaned as the juice of the hemp fermented is corrosive for the iron, thus keeping them clean they will work better and last longer. On examining a fibre machine there, after a day's work, it will be found as bright as polished steel, the effect of this caustic juice. The cleaning wheel of the machine used in that place is from 39 to 54 inches diameter; the last size is more used as it is calculated that the wheel of greater diameter cleans the large leaves with more facility, but on the other hand requires greater motive power for maintaining it in point of velocity which the cleaning demands. The number of revolutions in a cleaning wheel calculated there is from 150 to 200 per minute at the least; if not so arranged the extraction of the fibre takes too long and is defective, in which case the combination of the engine and other wheels are reformed until the required velocity is obtained.

Drying Stand.—This is for the purpose of hanging out the fibre to dry in the sun and may be erected by putting up posts 3½ or 4 feet high each at certain distances apart, and nailing small rails on top or against them or, if preferred, wire may be used instead, making sufficient stands as may be required under the circumstance; they can be put close enough as to merely allow of the attendants going between, and must be at no distance from the cleaning machine nor too far from the baling room, free from all shade and exposed in such a manner as to have the benefit of the sun at any hour.

The press is entitled to the next place; this is much needed so as to put in the smallest space possible a certain quantity of fibre for easy and cheap carriage and transmission.

Buildings.—The work can be carried on under one roof or in separate buildings as the planter chooses; the spaces required will bo for engine, cleaning machines, baling or press room, artificial drying room (the object of this is explained further on), and an open shed for the reception of the leaves from the field.—*Fiji Times.*

TEA IN 1890.

The violent fluctuations in exchange that accompanied the disturbance of the bullion market by the Windom Silver Bill have reduced commercial operations with the Far East, during the past year, very nearly to a gamble. With silver ranging from 44d to 54d an ounce, and the tael flying about like a shuttlecock between 4s 3d and 5s 3d, anything like sober calculation seems impossible. Yet 1890 will not, we believe, be remembered by China merchants as an altogether unsatisfactory year. Whether by good luck or good management, most things seem to have been "coming out." Certain classes of tea, for instance, have done well. Russian buyers failed to obtain all they wanted on the Hankow market, and completed their purchases in London at rates which gave a satisfactory profit to importers; common kinds have been in fair demand for "mixing" purposes, and the quality of the northern crop, at any rate, seems to have been on the whole better; so that dealers were less disposed to condemn China teas *in toto* as a doomed and depreciated quantity. With all this, however, the change in demand from Chinese to Indian produce has continued. The import of the former, which amounted to 93,000,000 lb. in 1888, having fallen to 83,000,000 lb. in 1889, and to 63,000,000 lb. for 1890; while Indian supplies rose from 73 to 74 and 79, and Ceylon from 20 to 28 and 40 millions respectively. The progress of the change is still better shown by certain statistics, recently published in our columns, giving the proportionate consumption in Great Britain, of China, India, and Ceylon tea, during each year of the thirteen from 1878 to 1890 inclusive. It will be sufficient for our purpose to reproduce here a few of the figures, to bring prominently out the ratio of change,

They are calculated to Nov. 30, and show the percentage of consumption of each kind of leaf.

	1878.	1881.	1884.	1887.	1890.
China ...	77	70	63	49	30
India ..	23	30	36	45	52
Ceylon ...	—	—	1	6	18

That there must be a limit to this decline very few will, we imagine, be found to deny. The reduction in stocks may indeed indicate that it has been approximately reached : for the falling-off in deliveries has not been commensurate with the decline in imports, and a decrease has consequently to be noted in the usual reserve. Many people still prefer China tea ; many will drink no other, recognising in it a delicacy of flavour which neither India nor Ceylon can rival. But for the large majority, to whom economy is a prior consideration, the greater strength and flavour of the latter, and its capacity to go on throwing off highly-coloured liquid after several waterings, preclude any question of return to the old order of things. What is wanted—we cannot repeat it too often—is such an alleviation in China as shall give the grower, there, a chance of competing with his Indian rival. We have often pointed out that the increasing demand from Russia has compensated, so far, for the decline in England ; but there has been a check, this year, even in that dispensation ; and we decline to believe but that India and Ceylon will find a way of cutting into the Russian trade, also, if the Chinese Government persists in maintaining an export duty of nearer 30 than 5 per cent. *ad valorem*, and in allowing its provincial subordinates to pile on *lekin* in addition. —*L. & C. Express.*

NOTES ON PRODUCE AND FINANCE.

THE DUTY ON TEA IN AMERICA.—A telegram from Washington states that the Ways and Means Committee of the House has agreed to favourably report the Bill imposing 10 per cent duty on teas imported from countries which discriminate against the United States. The object of the Bill is to meet the discriminating duty levied by the Canadian Government on teas imported through the United States.

CHEAP TEA.—At a meeting of the Manchester Association of Wholesale Tea Dealers, the subject of inferior tea and unscrupulous advertisements came under discussion. One member thought the time had come when the tea-dealers of this country should warn the public against buying the shilling and one-and-sixpenny rubbish so extensively advertised as tea. The trade was doing itself an injury by quietly allowing such injurious rubbish to be retailed to the public, to say nothing of keeping down profits. It was urged that an effort should be made to show the public that it was really false economy to drink low-priced tea. The president said he thought it would not serve any useful purpose if the association issued a manifesto, for if he were a non-trader, and such a thing as doleterious matter in tea met his eye, he should feel inclined to give up drinking tea altogether. If any proposal were made as to the desirability of using good and genuine tea only, then he would favour such a proposal, but he was not disposed to sanction the publication of a manifesto. Ultimately the matter was referred to a sub-committee.—*H. and C. Mail.*

TEA CURING IN CHINA.

Those who are unacquainted with the method of curing tea in China may feel interested in the following extract from a paper on the subject read by M. H. Frandin, Secretary of the French Legation, at a meeting of the Oriental Society at Pekin. Mr. Frandin, after describing the difference between black and green tea, said :—A description of the manipulation to which the tea is subjected will show the green tea is only distinguished from black tea, by the fact that the green has not been torrefied, or dried by heat, in the same manner as the black. The leaves once gathered are spread in light layers on straw mats. They are exposed to the sun until they are withered. They are then put in bamboo trays, and are triturated by the feet. A part of the juice of the leaf escapes, and after this operation the leaves are exposed again, and again triturated and continually agitated. But the drying is still not complete. The drying is still continued in rattan cylinders, which are separated into two parts by a bamboo partition. Underneath the cylinder is a chafing dish of ignited charcoal. The leaves are thrown on the concavity of the separation, which is furnished with a cover. From time to time the cover is raised, and the agitation is continued. When the leaves are completely dried, the cultivator has finished his work.

The tea merchant then takes possession of the tea. He delivers the tea to women and children, who remove the stems of the leaves and the little wooden twigs which often remain attached to the young sprouts. For black teas the leaves thus cleaned are put again in the cylinders above described. They are again dried. There then gently crushed by the hand, and the operation of heating, or torrefaction, is repeated until all the leaves can pass through a series of holes of different dimensions. The tea is then thrown into a winnowing machine, which separates the heavy from the light leaves and removes the dust. The light leaves and the dust go to make "brick tea." The green teas are first dried in the shade and afterwards dried in the same cylinder, but of which the concave separation is made by a plate of metal. Their colour is preserved by means of indigo. It remains, then, only to make the mixture of teas of different localities. The teas are boxed and shipped all over the world. Teas of first quality are nearly always the product of the first gathering. Sometimes, however, the second is good. Teas exported from Hankow have the generic name of "congou tea." The best comes from Ningchow, but it is also furnished by Hu Kuang and Ho-nan. The best black teas of Fukien are designated by the generic name of "congou tea" and "souchong tea." They come from the districts of Tenmon, Kai-su, Seng Cheng, Cheng Lock, Fockon, Pan Yang, You-kai, Pack Long, Pack-linn. The mean value of the congou and the souchong of best quality is forty taels the picul. Inferior teas of these grades bring 7 taels the picul. Dust tea varies from 3 to 5 taels the picul. The boxes generally weigh 28·7 kilogs. The superior teas are chiefly bought by the Russians. They are sent to Moscow by land, through Mongolia and Siberia and are called caravan teas. But a great deal of tea is sent by sea to Odessa. In the struggle of the Chinese merchants with the teas of India and Ceylon they mix teas of different prices. The largest part of their consignments ought not to cost more than 20 to 25 cents a pound, delivered in the London market. Frauds are sometimes practised and leaves of other shrubs are mixed with the tea leaves.

The brick tea business is exclusively in Russian hands. The two places at which it is manufactured are Foochow and Hankow. There are three kinds of bricks—(1) the brick of black tea imported into Siberia and some other Russian provinces; (2) the brick of green tea, much sought by the nomad tribes of China and Central Asia; (3) the tablet of superior tea sent to Russia. The brick of black tea is made of the leaves of the second and third gatherings, which are generally over-mature. It contains the light leaves, the stems, the dust, the twigs and residue of the superior teas left over from former years. These substances are all reduced to powder and mixed together. The quantity necessary to make a brick is put into a piece of cloth. This piece of cloth is passed, with its contents, during several seconds in a jet of steam. Then this moist dust is put into a wooden mould which has been covered with a light layer of dry tea powder of better quality than the contents of the cloth, and then is pressed in a steam machine. The brick comes out of the mould as hard as rock. It is dried on planks during fifteen days, and then it is wrapped in paper, properly ticketed, and sent to its destination. Usually sixty bricks are in one package. Bricks are made of different qualities,

The harder the brick the better it is appreciated by the people of Central Asia. It requires an axe or hammer to break one of them. The green brick tea is made in like manner, but of green tea. Green brick tea is made larger than the black. All the brick teas replace money in business affairs in Central Asia. The Mongols divide a brick into thirty equal parts. Each part is called "cha-ra." A sheep, for example, is worth 120 cha-ra, that is to say, four bricks. A brick in Mongolia being worth 15 to 20 cents, a sheep in that wild country would be worth 45 to 60 cents. The Mongolians boil water in a pot of metal, using camel dung for fuel. They break off a portion of a brick and throw it into the pot with milk, butter, sheep fat, and salt. After a few minutes of ebullition, the beverage is ready. Tablets of green tea are made dry, by means of a hydraulic press, out of congou of good quality. A tablet is divided into eight equal portions, like chocolate tablets. It weighs 110 grams (a gram is 15·438 grains troy). Owing to the facility of transportation and its conservation of its aroma, the Russian Government uses it largely for its troops.—*H. & C. Mail*, Jan. 16.

RAINFALL IN KADUGANNAWA.

Mr. Wm. MacGregor of Gona Adika favours us with the rainfall, and writes:—The annexed memo. of rainfall for the Kadugannawa district during 1890 may interest some of your readers.

"A nice shower of rain fell last evening registering ·90, and it is raining today again. The tea bushes wanted it badly, ·75 registered this morning (5th).

MEMO.

	No. of days in each month of which rain fell.	Total rainfall.
1890—January ...	3 days	1·24
February ...	8 "	5·33
March ..	9 "	2·94
April ...	20 "	13·20
May ...	7 "	4 01
June ...	18 "	11·35
July ...	15 "	5 79
August ...	13 "	4·67
September ...	14 "	10·50
October ...	19 "	7·30
November ...	17 "	12 56
December ...	6 "	7·65
Totals	149 days	86·54

LIQUID GUTTA-PERCHA is made thus:—Gutta-percha in thin slices, 1 oz. chloroform, 8fl. oz.; carbonate of lead, in fine powder, 1 oz. Add the gutta-percha to 6fl. oz. of the chloroform in a stoppered bottle and shake them together frequently until the solution has been effected. Then add the carbonate of lead previously mixed with the remainder of the chloroform, and, having several times shaken the whole together, set the mixture aside and let it remain at rest until the insoluble matter has subsided. Lastly, decant the clear liquid, and keep it in a well-stoppered bottle.—*Indian Engineer.*

CINCHONA BARKS.—It is strange to see by the following extract from *Chemist and Druggist* that not only Ceylon but Java and Indian bark have, on the average, fallen off in richness last year:—The following figures denote the average percentage equivalent in sulphate of quinine of the principal cinchona barks of commerce during the last three years:—

	1890	1889	1888
Ceylon cinchona bark ...	2⅛	2⅛	2½
East Indian	2	2	2½
Java	4	4⅛	4
Calisaya cultivated ...	4½	4½	4½

The following are the unit prices (in pence per lb.) of cinchona bark in London on January 1st of the last seven years:—

1885	1886	1887	1888	1889	1890	1891
6 to 7	4½ to 5	3¼ to 3½	2¼ to 2¾	1⅝ to 1¾	1¾ to 2	1⅝ to 1¾

GALLE: CACAO.—It will be recollected that, a short time back, reference was made to the existence of cacao at Mapalagama, a little beyond Baddegama, where the trees were said by a correspondent to be of immense size and vigorous growth in spite of the dense jungle which surrounded them, and speculation was then rife as to who could possibly have introduced the product into the district. There can be no doubt that there are trees in the neighbourhood, the value of whose produce the natives have come to recognize to some extent, as a few days ago I am told quite a large number of pods were taken across the ferry, all more or less in an un ripe condition.—Local "Times."

THE REVIVAL OF COFFEE.—Liberian Coffee clearings in 1891. We learn that, in spite of the alleged failure of Liberian coffee in Kalutara, two estates are opening clearings of it this year, the proprietors being confident that, at current rates and owing to the improving prospects before coffee generally, it will turn out a remunerative cultivation. An experienced Kalutara planter recently expressed the opinion that in topping Liberian coffee in the same manner as we had been accustomed to do the Arabian variety we made a great mistake. In his opinion the Liberian is a forest tree, and if left untopped and planted on suitable soil, would yield excellent returns. We shall watch the experiment with great interest, more especially as several Uva planters have recently expressed the opinion that coffee there was showing signs of a distinct revival owing, doubtless, to the reduction in the area over which it is cultivated. We sincerely hope this may prove to be the case.—*Ibid.*

THE RETURN OF MR. DAVID REID, at this time, when the export of tea has reached such large dimensions, is rather noticeable seeing that he was amongst the first to take up its cultivation on any considerable scale in Ceylon. In this connection it may be of interest to recall the fact that the first estate opened by Messrs. Reid, Rutherford, and Mackay was Dewalakande, in the Kelani Valley. This block of land had been originally acquired by them for the purpose of cutting sleepers for the Nawalapitiya section of the line which they constructed, and much valuable timber was felled by them from it and carted up to the Ginigatenne Gap, and so on to Nawalapitiya for use as sleepers, etc. Not knowing what to do with the land, Mr. Reid was advised—by Mr. Jack Tyndall we believe—to plant it up with tea, and so nurseries were formed and the estate was opened. From this small beginning the large Company, which has since acquired so many valuable properties, grew; Mariawatto being afterwards laid down in tea. From that date these indefatigable pioneers of the new cultivation never slackened in their efforts to extend it, and how successful they were will always remain a record in our island's history.—*Ibid.*

A NEW FIBRE.—A new fibre plant has just been discovered that is claimed to be better than ramie. It is a native of the West Indies, having been found on the island of Trinidad. The great advantage possessed by this plant is that the ribbons at nearly all times of the year are easily despatched from the wooden portion by simply stripping them with the hand, and, therefore, a decorticating machine is not required as for ramie. When it is known how readily the stems allow themselves to be deprived of their coating of bark and fibre it will be seen what an advantage this simple fact gives the new product over many of the fibre-producing plants. All that is required is to cut the stems, which are fully ten feet long, split the bark at the larger end, and strip off the bark from end to end without stopping, as fortunately the stems have no side branches. Samples submitted to London brokers were most favourably reported on, and were valued at from £17 to £20 per ton. It is thought that ramie will probably be beaten by this new fibre, when cultivators fully realise the greater ease and consequent less expense with which it can be decorticated.—*India Rubber Journal.*

Correspondence.

To the Editor.

INDIAN TEA EXPORTS.

Indian Tea Association, Calcutta, Jan. 12th.

DEAR SIR,—The General Committee have the pleasure to hand you their usual Monthly Return of shipments of tea from Calcutta, and also a Return of Exports of Ceylon Tea for four years up to the 22nd December 1890.

EXPORTS OF INDIAN TEA FROM CALCUTTA.

	1890 lb.	1889 lb.	1888 lb.
Exports to Great Britain in Dec.	14,156,971	11,811,301	11,801,612
Exports to Great Britain from 1st May to 31st Dec.	84,428,563	79,935,589	79,340,409
Exports to Australia and New Zealand in Dec. ...	765,156	459,226	369,355
Exports to Australia and New Zealand from 1st May to 31st Dec. ...	4,233,168	2,837,075	2,397,100
Exports to America in Dec.	34,158	16,640	23,619
Exports to America from 1st May to 31st Dec. ...	116,040	142,190	92,644
Exports to other places in Dec.	61,250	74,022	31,244
Exports to other places from 1st May to 31st Dec.	815,158	1,270,773	635,003
Total Exports from 1st May to 31st Dec. ...	89,592,929	84,185,627	82,465,156

—Yours faithfully, S. E. J. CLARKE, Secretary.

ARTIFICIAL COMBS FOR CEYLON BEES.

Glasgow, January 14th.

DEAR SIR,—I have read with interest in the *Overland Observer* of the 13th Nov. last an article on "Artificial Combs for Ceylon Bees."*

The artificial comb (or comb foundation as it is called) is made of a thin sheet of wax upon which the forms of the cells are impressed, and when first given to the bees it is not ready for the storage of honey. The bees have first to draw out the sides of the cells until they (the cells) are of the usual depth. This, of course, is a great saving of labour to the bees, as the manufacture of wax consumes much of their time and strength.

I do not know anything of the species or habits of Ceylon bees, but unless they differ considerably from those of the bees commonly used in England, (the common black, Ligurian, Cyprian Carniolan, &c.) I fear that, as a method of attracting bees, the hanging of combs in the vicinity of bungalows would not be attended with success.

Supposing that the habits of the Ceylon bees are similar to those of the English they will swarm at a certain time of the year. (In England it is generally in May or June.) The swarm should then be taken and placed in a hive previously fitted up with comb foundation, which the bees would speedily draw out and then commence work in the usual manner.

From your Directory I see that Ceylon "has several useful indigenous bees," and I should be interested by any information regarding the habits and species of these bees and if any have been domesticated or kept in hives.—Yours, &c.,

APIS.

[We shall send our correspondent some of the back numbers of our *Tropical Agriculturist* with information about bees.—ED. *T. A.*]

* See page 653.—ED. *T. A.*

CACAO CULTIVATION AND CRITICS.

Galagedara, January 21st.

SIR,—My attention has been drawn to a letter signed "1873" headed "Planting Notes for 1891" appearing in your paper of 10th inst.*

Under the heading "Cacao" your correspondent, who evidently has got to the bottom of most things, teaches the Galagedara planters *how to do it.*

There is an old and somewhat musty saying—"First catch your hare, then cook him."

Your correspondent tells us, first, how to grow cacao, and *make it crop* (a secret your t'otherest correspondent "Eldorado" appears not to have found out), and then proceeds to tell us how to catch, and afterwards cook, the wretches who steal our crops. Now, sir, it is all very well for "1873" to write to your paper, but I have one or two questions I should like to put to him through you:—

1st. Is it not a fact that he was the manager of the estate quoted by him as losing 50 per cent of its crops, owing to the depredations of thieves, for some time before the "easy-going office man" came out from England to take charge?

2nd. Did not the aforesaid "easy-going office man" oust "1873" for reasons best known to "1873" and the "e.-g. o. m."?

3rd. Will "1873" state precisely what his experience has been in this country, with regard to planting cacao and shade: *i.e.* how many acres of cacao has he planted, and what return did he get, when his cacao came into bearing?

4th. Did he ever hear a thief on the Galagedara side, say of "such a one" (the English is "1873" 's not mine) "Don't rob that master, he is kind, is friendly with the headman, unmerciful when he catches us, and relentless in hunting us down. Let us go over to —," and so on?

5th. And, if he never heard a thief say this, (as of course he never did) why does he write such stuff?

I leave abler pens than mine to deal with "1873" 's strictures on coffee and tea growing; and enclosing my card, am, sir, your obedient servant, GALAGEDARA CACAO.

DANDELION.

Pussellawa, Jan. 26th.

DEAR SIR,—Can you or any of your many readers inform me, if the dandelion plant can be got, and grown in Ceylon? I am anxious to try it, as it makes a very good salad.—Yours faithfully, UPPER NILAMBE.

[The plant is allied to chicory. We have not heard of its being grown in Ceylon, but we do not see why it should not be successfully cultivated in our hill regions.—ED. *T. A.*]

COCONUTS:—A FREAK OF NATURE.

DEAR SIR,—Herewith a bunch of coconuts with three fruits, two of which you will find are like the king-coconuts, while the other is quite green, all in the same cluster and from a tree about 40 years old which hitherto never had anything but green-colored nuts, and have about four clusters at present all green-colored. One nut you will note is small; this I believe is attributable to rats making an attempt when the fruit was tender to eat it. There were two other green-

* See pages 569 and 593.—ED. *T. A.*

coloured nuts on same cluster which unfortunately were destroyed by rats at their early stage. D.

[The cluster of nuts which are a curiosity can be seen at our office.—ED. *T. A.*]

POULTRY DISEASE: A REMEDY WANTED.

DEAR SIR,—Can you or any of your correspondents gives me some information as to the treatment of a disease which has appeared amongst my poultry? It may be described as follows:—Lumps all over the head, which increase in size until the bird is blinded by them when, of course, it dies of starvation. Some chicks were first carried off, and then it attacked and slew several promising young turkeys. Any advice as to the treatment of the disease will be most gratefully received by a

DISCOURAGED HOUSEWIFE.

[This is no doubt the disease, so fatal to turkeys, regarding which we had several letters a year or so ago. Segregation and fumigation with sulphur or tar should be tried.—ED. *T. A.*]

DANDELION.

Peradeniya, Feb. 2nd.

SIR,—Your correspondent "Upper Nilambe" can obtain dandelion plants from Hakgala gardens on application. We obtained seed from N. India in 1882, and in my annual reports for that and the succeeding year, will be found, under the heading "Taraxacum," a full account of its progress as a cultivation. The roots do not become very large in our poor soil; but the plant has already escaped from the garden and commenced to establish itself as a wild plant. I observed last September a large colony of it by the side of the Badulla road a little below Hakgala, and it will doubtless in time become a common weed in our high districts as it has already in the Nilgiris.—Yours faithfully, HENRY TRIMEN.

OUR JUNGLE TREES AND OTHER PRODUCTS.

DEAR SIR,—Has it never occurred to you while walking through the jungles here, that during almost every month different kinds of seeds are to be found, and, how few planters can tell the names of the trees their seeds came from? These reflections have often led me to wish for some pamphlet or booklet on the subject; and I think, now that the Ceylon Government have so able a staff of Forest Officers, it might undertake the publication of a work in colored illustrations full size of the fruits so far as practicable, and of the seeds of the various useful trees now to be found in our jungles. Such a work ought to have a ready sale in Ceylon, but apart from that, it would be an immense boon to the European and English-speaking natives of the country. In addition to a description of the seed or fruit, there ought to be a short description of the leaves, bark, color of the wood and its uses.

How many planters in Ceylon have been deceived by rascally sawyers and shingle contractors? Is it not the case that many planters must trust to their carpenters' honesty or knowledge of the timber required for building or shingling purposes, and they are scarcely to be blamed if they have no means of acquiring the information, hence I think a booklet of the kind I refer to is much wanted. To give only one instance. The roof of a bungalow scarcely three years shingled with shingles said to be from one tree, is now in such a state of dry rot, that many of the shingles can be broken between finger and thumb like shortbread. The superintendent trusted to his carpenter's knowledge of suitable wood, as the best known shingle trees were perhaps not so plentiful as in the earlier coffee days.—Yours truly, AN OLD PLANTER.

["Old Planter" is making a rather large order all at once on the Forest Department: what is first wanted is a thoroughly reliable Guide to the various Timber Trees and their native names. For this want, the late Mr. Wm. Ferguson's pamphlet deserves to be reprinted; but from Dr. Trimen's list, as now available, "Old Planter" might learn a good deal. Many Sinhalese can tell him their name for the tree on which any fruit or seed produced, grow and then by referring to the index, he would be able to get the Botanical name. Still there is no doubt that later on we may well look to the Government and their Forest Department for a useful Guide to our jungle trees and products.—ED. *T. A.*]

RAINFALL IN KADUGANNAWA.

At the Gate of the Central Province, Feb. 7th.

DEAR MR. EDITOR,—I for one was interested in Mr. Wm. Macgregor's memo. of rainfall * at the Gampola end of Kadugannawa. I thought that the Bukanda hill would have attracted more rain than it appears to have done. Situated as I am in the centre of the district, I often envy my neighbours at Allagalla and Gona Adika, because the rain clouds seem generally to discharge themselves at the extremes of the district, leaving me to mourn over disappointed hopes. I also annex a memo. of rainfall, which may be of interest to someone, should you think proper to print it. I only commenced to keep a register from the middle of 1887, but the six months of that year show what ought to have been a heavy rainfall for the year.

The old district, so favorably known in the days of coffee, is being rapidly opened up for tea, and will yet come to the front. This is undoubtedly the elevation for indigenous tea, and it goes on flushing when all other jâts shut up. There was some talk about Government opening up the roads from this to Gampola, but if they are not quick about it, they will have a difficulty in finding it when they do commence.

Kadugannawa village is fairly healthy, but I am surprised it is so, for the drainage and smells are abominable. If the Government Agent came oftener it would be a blessing. He was here the other day, and in anticipation of his visit huts were whitewashed, drains cleansed, and dirt put out of sight. When I saw the change in the aspect of affairs, I began to think that the Cesarevitch, at least, was to honor us with his august presence. We want a police station badly, and a responsible man to look after the sanitation of the place. The villagers on all sides are a lawless lot, and a fine field there is here within a radius of 4 or 5 miles, for the Salvation Army to work in, but they prefer to have a meeting occasionally for the English-speaking population, and the big drum is regularly beaten in the street to the great delectation of the little boys. Excuse these disjointed notes.—Yours truly, KADUGANNAWA.

MEMO OF RAINFALL.

	Days.	1887 inches	Days.	1888 inches.	Days.	1889 inches.	Days.	1890 inches.
Jan.	...	...	...	...	...	...	6	5·34
Feb.	...	...	2	·37	...	...	6	4·65
March	...	...	6	2·21	15	10.14	6	1·70
April	...	...	7	4 85	22	12.34	19	6·87
May	...	...	11	6·31	19	10.74	8	4·14
June	...	...	20	15·92	18	3.91	15	11·88
July	...	4.22	10	1·91	24	10·54	17	9·01
Aug.	16	5·91	16	3·69	15	8·15	16	5·05
Sept.	15	3·25	14	3·70	17	9·31	13	10·52
Oct.	22	18·47	24	18·18	11	6·97	20	9·83
Nov.	23	12·89	18	5·22	10	7·60	13	7·81
Dec.	20	16·45	19	8 30	7	2·08	9	6·09
Total ...	107	61·19	138	70·66	158	81·78	148	82·89

* See page 649.—ED. *T. A.*

DECREASING RAINFALL IN MASKELIYA: THE DRY CYCLE?

Deeside, Maskeliya, Feb. 9th.

DEAR SIR,—The rainfall on Laxapana for last year, (see page 621) as against previous average, took you evidently by surprise; but I fancy the rain deposit is greatly decreasing all over the district. On this estate a nine years' average 1874-1882 gives 137 06 inches with a maximum fall in 1877 of 183·83 in. and a minimum in 1875 of 119 55 in. The record of rainfall was continued to end of July 1883 and shows for the 7 months 88 00 in. After that the record ceases until end of 1889, and the 1890 complete record gives a total of 89 92 in, or 47·14 below the 9 years' average and 29 63 below the minimum of the 9 years and no less than 93 91 below maximum of that period.—Yours truly,

WM. MITCHELL.

P.S.—I fear your idea of the gauge being in different positions won't hold "*water*."

CENTRAL AFRICA COOKERY.—As a rule, only one principal meal is eaten in Central Africa, in the early part of the evening. It usually consists of parrot soup, roasted or stewed monkeys, alligator eggs (also well liked by Europeans), and birds of every description. They also have moambo, or palm chops, and fish. A great delicacy, so considered by Europeans and natives alike, is elephant's feet and trunk. These have somewhat the taste of veal. To prepare them, the natives dig a hole about five feet deep in the sand and in it build a large fire. After the sand is thoroughly heated the fire is removed, leaving only the ashes in the hole. The trunk and feet are placed in this hole and covered with leaves, and afterward with hot sand. In two hours they are done. All carcasses of animals which are to be cooked are placed on a block of wood and pounded until every bone is broken, care being taken not to tear or bruise the skin. They are then boiled or roasted on an open wood fire or in hot sand or ashes, without removing the hide or feathers. The cooking is of a very inferior grade, the only spices used being salt and pepper. The kitchen untensils consist of common earthen or wooden ware. Very little time is taken for setting or decorating the table; knives, forks, and napkins are dispensed with. Africans have several vegetables well liked by Europeans. N'gutti-u'sengo is a dish eaten all over Africa. It consists of egg-p'ant, small fish somewhat like our sardine, and the roots of the cassava or manioca plant (called n'gutti), which have a knotty appearance and often weigh as much as twenty pounds. As the latter contains poison, the manioca is soaked in water for three or four days to extract the poisonous substance. It is then cut and sliced, and small tomatoes are added. All is placed in a vessel with water, and seasoned with salt and pepper, and boiled. Moabo, or, as the Europeans call it palm chops, is also a favorite dish. The palm nuts are first boiled in water, until the pulpy substance loosens from the pit, then the shell, which contains a very delicious oil, is placed in a wooden mortar and crushed to obtain the oil. Whatever the meal consists of—meat, fish, mussels—is put in a vessel, adding the oil and the pulpy part of the palm nut, also red pepper and salt, and is boiled. Roast or boiled squash (loenge) is generally eaten with it. Sweet potatoes (m'balla benga) are more farinaceous and sweeter than ours, but do not taste so good. They are boiled or roasted. Bananas (bitaobo) weigh about half a pound each and are about fifteen inches long. When half ripe they are cut in slices and boiled in water with salt and pepper. N'sinsi is a little red bean, which is boiled in water without salt or pepper, and is freely eaten For peanut bread (chisula) the peanuts are first roasted and then crushed. This mass is then rolled and put into the skin of a banana, adding a little pressure, forming it into a body. It readily retains this shape from the pressure of the oily substance in the peanut.—*New York World.*

THE FOREST IN DEHIGAMA'S CLAIM is about 5,000 acres and there are 4,000 acres of patana which would grow very good tea indeed I should think. The total amount is only 12,000 acres and really the fuss made about it is out of all proportions to what it is—many a larger claim has been admitted to natives, but they oppose simply because Europeans have got it.—*Cor.*

EXTENSION OF TEA CULTIVATION IN HAPUTALE.—Mr. Lipton, the proprietor of the estates known as the Dambetenne group, is rapidly extending the cultivation of tea on his places. Nearly 200 acres of forest on Dambetenne and Monerankande estates are to be felled and cleared and tea planted on them during this year.—A new tea factory is to be built on Meriabedde estate, of which Mr. E. H. de Winton is superintendent.—*Cor.*

IN THE NORTHERN TERRITORY the only thing which was found to keep the white ant pest in check was a mixture of flour, sugar, and arsenic, mixed to the consistency of putty with water. A small piece of the mixture should be placed wherever the nest is known to exist. If an examination is made a few days after using this remedy thousands of dead ants will be discovered in the vicinity of the poison.—*Mildura Irrigationist*, Jan. 7th.

CEYLON TEA AT HOME.—Some time back I mentioned that a firm of Mincing Lane Tea retailers were arranging for stumping the country in the interests of Ceylon tea. The campaign is opened, and on Wednesday night Mr. C. S. Hicks appeared on the platform at the People's Palace and delivered a lecture, illustrated with a large number of lime light views of Ceylon. Mr. Hicks is well known to the habitues of the Lane as the proprietor of the "Dalukola" tea which is, I believe, packed in Colombo by Messrs. Leechman & Co. Another new agency for the distribution of Ceylon tea, has appeared on the scene under the title of the Agra Ceylon Tea Association. This association "guarantees that all its teas are exclusively derived from the four celebrated tea gardens on the estates in the Island of Ceylon, belonging to Mr. H. R. Farquharson, M. P." Numerous branches are said to be in the course of being started and a shop has been already opened in Middle Street, Yeovil. Good luck to Mr. Farquharson and his tea shops!—London *Cor.*

THE DAIRYING INDUSTRY OF VICTORIA has a special interest to us in Ceylon, since if we only could get supplied with butter and cheese, as well as fruit and other produce from the Southern Colonies, the inducement to take off larger quantities of our teas would be greatly increased. Mr. Deakin handed us a paper with a Report on the Victorian Dairying Industry and we quote to show the enormous quantities of butter which passes our door to the United Kingdom. Not only Ceylon but a great part of India might be supplied by shipments through Colombo. We quote as follows:—

I also submit report of the shipment of this seasons surplus butter to England, consisting of 10 shipments. The shipments began with the steamer "Victoria," which sailed on 11th Oct., and the last was by the S. S. "Massilia" on the 17th Jan. The Orient Company's steamers took the remainder every fortnight between these dates. The department gathered it at the refrigerating works, Newport, from all parts of the colony, to be frozen or chilled in terms of the company's regulations previous to shipment. The total quantity sent is 731 tons—nearly double what we considered an enormous export last season, consisting of 21,954 56 lb cases and 17,827 70 lb. kegs. The merchants supplied fully a third of this large quantity with what is known in the trade as "mixed butters." Farmers' small lots arriving weekly in a glutted market are bought up, resalted and packed, and where this is done with skill before the butter is stale a fair article is produced. From news to hand of five shipments, we learn that £5 10s and up to £5 16s per cwt., has been obtained. This must be very satisfactory to producers

"APIARIAN":

ARTIFICIAL COMBS FOR CEYLON BEES?

It is marvellous in how many ways the advance and application of science touch industries even the most primitive all over the world. The suggestion we make today (Nov. 5, 1890.) is to take advantage of modern scientific advance in the method of collecting the honey of the wild bees which so musically fill the vast forests of our inland districts with their continuous humming. Our attention has been called to this subject by one who tells us how struck he has been by the large advance made in the quantity of honey exported from Italy since the introduction and use of artificial combs. We believe that it has long been a subject of complaint that many—perhaps the greater part—of our forest fires are due to the means employed by the native bee-hunters to secure the object of their quest. As each year demonstrates to us the necessity for careful Forest Conservation, this particular point becomes one of much importance, and it is one that Colonel Clarke and his Deputies will have carefully to consider and, if possible, deal with. Every traveller through our jungles is pretty sure to come upon one or more trees during the course of his day's journey which have been manifestly destroyed by fire, and it has simply been a fortunate chance, due generally to weather conditions at the time of ignition, that a case of isolated destruction has failed to initiate a far-reaching conflagration. Although along many frequented lines of travel such burned trees have mostly been lighted by the fires of passers-by carelessly placed, those so often met with in the inner recesses of the forests have as a rule been destroyed by the efforts of the bee-hunters to smoke out their intended victims.

We are told that nearly all the honey now consumed in England is derived from artificial combs, in which it is largely imported from the Continent of Europe. It would, therefore, certainly appear that a useful industry might be developed by offering to the Ceylon bee, which provides us with such exquisitely delicate honey, an opportunity for storing his hoards without incurring the preliminary labour of constructing his "safe deposit" cells. The Italian bee, with the keen instinct of his kind, has almost abandoned the labour of cell-making. Directly he lights upon the artificial object, attracted to it by a bait of a dab or two of honey, he recognises the luxurious provision and straightway sets to work storing his honey, and produces,—owing to this saving of his preliminary labour,—more than twice the quantity he could before overtake. We should think that the men who follow the very laborious and risky occupation of bee hunters in Ceylon would gladly see around their huts the millions of bees which, if tempted at the proper season, would swarm to the artificial combs provided for them. We have described the occupation of these men as a risky one. It is essentially so. It is rare in the remoter bee districts to see a hunter free from scars—the result of his combats with the bears who share with himself a strong desire to secure wild honey. From such contests the comparative domesticating of the wild bees would free the hunter, and his harvest would be a fuller one, be gathered with infinitely less of labour and exposure, and with more of certainty. There is one thing, perhaps, to be said which might negative the advantages we have pointed out, and that is that the production of bees-wax would be lessened by the use of artificial combs. What proportion of value exists between the honey and the wax yielded by a certain weight of comb we do not know, but we should presume the value of the honey must largely preponderate. Meantime, to make a beginning in the experiment, some useful result might follow if one or more of our Assistant Government Agents resident in the bee districts would procure and hang some artificial combs around their bungalows. They would soon have many pleasant neighbours in their comparative solitude, and success might lead to a very wide and paying adoption of their novel devices.

THE ACTION OF LIME ON CLAY SOILS.

That lime promotes the fertility of heavy clay soils is a fact that has for many generations been well known to all agriculturists; but the scientific reason for the beneficial action arising from its application has not, to the best of my belief, been at any time at all satisfactorily explained. The question, however, remains one of first importance in the science of soils and I therefore make no apology for offering an explanation, or rather theory, which, to my doubtless, somewhat partial mind, seems to go a considerable way towards the elucidation of the problem.

I take it for granted that all interested know that a clay soil is not by any means a pure clay (hydrated silicate of alumina), but a mixture of *impure* with pure clay (much more of the former than of the latter), plus sand, iron oxides, organic matter, &c. The clays which form its bulk have been derived from the natural decay or weathering of mineral silicates, containing, besides, aluminium, alkali, or alkaline-earth metals, and they occur in it in all stages of impurity or further decomposition. As an invariable rule, other things being equal, the greater the normal impurity of the clays the greater the fertility of the soil. A *pure* piece of clay is like pure quartz-sand—so much dead, inert matter; a plant can make nothing of it, can take nothing from it. In no fertile clay soil, however, even of the heaviest description, does there occur at any time more than about 10 per cent. of *absolutely* pure clay. Well, then, what is the composition of the average clay particle? That depends on the mineral from which it was derived. If from the felspars, its most common origin, it will be a hydrated silicate of alumina plus silicate of potash, or, instead of the potash, soda and lime. I will suppose, for brevity's sake, that my clay particles have the former composition, and the explanation which I will offer with regard to their behaviour can be applied with very little difficulty to any of the other cases. Clay particles of the above composition, when subjected to the action of water containing carbonic acid gas, lose potash. That I have repeatedly proved by experiment. If the carbonic acid is in fair excess, it comes away altogether as carbonate of potash; but if there is not a sufficiency of this anhydride, it is liberated partly as soluble silicate of potash (soluble glass). Should lime, however, in this latter case be present, the practically insoluble calcium silicate will be constituted, and the potash freed to form a soluble salt with any other acid that may be present and available, such as carbonic, sulphur, nitric, &c. A grass plant gowing in clay soil does not, it is evident, send sufficient carbonic acid through its root-hairs into the soil, as many other plants do, to completely convert the liberated potash into carbonate, and the consequence is that the soluble silicate of potash which is permitted to form is drawn into the vegetable, as well as the carbonate of that alkali. Now silica and silicates are decidedly injurious, to all vegetables doubtless, but particularly to agricultural plants. I say injuriousu; the day has gone by for considering silica an essential, or useful, or even a merely innoxious accessory. A little examination of the plant-physiology shows that it is injurious. The organism tries to get rid of it as speedily as possible—that is, at least to get it out of the way of its general circulation; it unfortunately has no means of casting it off altogether. Here, I need scarcely refer to the well-known experiments which have, over and over again, conclusively shown that the grass plant does not require silica as a supporting or strengthening material. Now we come to see the use of lime in the clay soil, especially in the case of the cultivation of cereals and pastoral grasses. The lime added and mixed up with the soil acts on the soluble silicate of potash as it is formed, and combines with the silica, constituting, as I have already remarked, the practically insoluble silicate of lime, which, of course, being normally indissolvable in the soil, cannot pass into the body of the plant. Therefore, the organism profits by its exclusion, and as a consequence so does the farmer. The energies of the plant are not spent in getting rid of silica if there is

no silica to get rid of, and its ordinary processes of nutrition can progress uninterruptedly.

The breaking up of the soluble silicate* could be as well accomplished by the perfect aëration of the soil so that every particle could be constantly exposed to fresh portions of aërial carbonic acid and oxygen: and this is one great reason why fine deep tillage, where it is possible, so improves clayey soils, but of course a tillage that will bring about the perfect aëration of heavy clay, is all but impossible; therefore the advantage of judiciously using lime.

The soluble alkaline silicate which, when undecomposed, passes into the plant in the water-stream through the roots, is evidently very soon split up by the vegetable, and the silica combined with some substance, such as an aldehyde, and carried on in solution in this state to the peripheries of the stem, &c., where, by the process of practically unrestrained evaporation, the compound is again split up, the aldehyde going off into the air, and the solid silica remaining stranded in the cuticle and the other walls, or occasionally even in the cavities of the epidermal layer.

The silicate of lime formed in the above reaction itself ultimately undergoes decomposition by natural water containing carbonic acid, but the decomposition is always complete; it devolves entirely into carbonate of lime and free insoluble silica.—ALEXANDER JOHNSTONE, Edinburgh University.—*Nature.*

* Only the alkali metals, of which potassium and sodium are the only two that normally occur in soils, from silicates soluble in water.

COFFEE CULTIVATION IN SOUTH AMERICA:

A SYNDICATE ORGANISED TO EXPLORE THE EASTERN SLOPES OF THE ANDES.

This mail brought us a letter from an ex-Ceylon planting friend announcing that there was a project on foot in London to send out an exploring or pioneering party to Peru with reference to taking up land suitable for coffee. The great prospective scarcity of this article—prices even now approximate to 140s a cwt.—forms the special inducement or this mission. Its inception seems to be due to men of high commercial standing in "the City" and among the supporters named to us are Sir Alfred Dent and Sir Hugh Low. So much for the mail news contained in our private letter; but a new and more practical interest is given to the scheme by the fact that the London Syndicate have telegraphed out to Ceylon to get the services of Mr. P. D. Clarke of Dr. Trimen's staff, to join the exploring party. Mr. Clarke who is a son of a well-known Curator of the Glasgow Botanic Gardens, has now been 11 years in Ceylon, giving faithful though unobtrusive service for all that period without any leave of absence, in our Royal Botanic Gardens. Under these circumstances, the Government could scarcely do otherwise than grant the leave of absence required to enable Mr. Clarke to discharge the temporary duty now required of him. He gets leave for nine months and goes to London by the Orient steamer "Cuzco" tonight. The expedition so far as Mr. Clarke knows is bound for the Eastern slopes of the Andes near, curiously enough, to the town of Cuzco and no doubt advantage is to be taken of the trans-Andean railway to make the West coast the outlet of such plantations as may be established. The only other member of the Expedition so far as Mr. Clarke knows is Mr. J. L. Shand and "coffee" culture is the main, if not the only object in view. No doubt the duty of Messrs. Shand, Clarke and their colleagues will be to report on the fitness of available land for plantations, on the climate, soil, means of access, labour, &c. Possibly, if all go well, nurseries may at once be established and clearings be commenced. With Sir Alfred Dent on the Syndicate, we should suppose there may be an idea of importing Chinese as labourers.

In Ceylon, Mr. Clarke in a quiet way has been giving a good deal of attention to coffee. He strongly shares our opinion that planters of Liberian coffee some ten years ago were in far too great a hurry to give up the cultivation. His own experience last year on half-an-acre planted with Liberian coffee at Peradeniya is worth giving: it is that he netted R222·62 from the crop off half an acre. Allowing for special attention to the trees, there is margin enough here surely to encourage any one to go in for Liberian Coffee on suitable areas of soil in Ceylon.

Meantime we hope to have interesting intelligence of the doings of the Trans-Andean Coffee Expedition of 1891, and we wish the party all success.

COCONUT CULTIVATION IN THE INTERIOR OF THE WESTERN PROVINCE

1890.—The coconut crop of the district has been an average, and the price of copra has kept well up, so that, on the whole, proprietors with mature estates have nothing to complain of; but the deficient rainfall from May to October will tell against the outturn of 1891. That is the season of the heaviest gatherings, and the rainfall at that season regulates the crops of the corresponding months of the following year to a great extent.

Towards the end of the year, leaf disease reappeared, but not nearly to the same extent as two years ago. In some few cases the same trees are affected as suffered then, but not all, and some fresh cases, nothing of any consequence, however. I believe it to be the result of drought on stiff soils that too easily yield up their moisture.

1891 has opened well in the way of rainfall, January having given 3·14 inches and it is thundering all round while I write. W. B. L.

PLANTING IN GUATEMALA.—We learn that Mr. W. J. Forsyth, formerly of Maturata, is getting on well as manager of extensive coffee and cinchona plantations in Central America. Labour is the chief difficulty. We hope to have a letter erelong, bringing up Mr. Forsyth's experience from the date of his last communication.

A THIRTY-FIVE YEARS' CYCLE of wet and dry periods alternately has just been worked out by Herr Bruchen, who shows that,—

In Western Europe and Eastern North America the wet period, he shows, gives from a sixth to a fifth more rain than the dry period. In Siberia and the Far West of North America they give a third to a half more rain. Since 1870 the world has, in his opinion, been passing through one of the wet periods, which has produced bad harvests on the seaboards but greater fertility in the middle parts of the continents. During the first 20 years of the next century he expects another dry period to come, having an annual humidity of from 15 to 20 per cent. less than at present. Herr Brüchner also endeavors to show that the great general migrations of mankind are and have been connected with these periods.

But in the tropics and Ceylon especially, Herr Bruchen would find eleven year cycles nearer the mark for the alternations.

A MINCING LANE SALE ROOM.

The *Daily Graphic* gives an engraving entitled

The Tea Trade: Business brisk at Mincing Lane Sale Rooms yesterday:

"Capel" is in the box. A sample of "the precious stuff" appears on high, and in the foreground is a separate engraving of

Mr. J. Hillyard the dealer who bought the famous sample of Golden Tip.

The letterpress is as follows:—

There is an old story afloat of a Stock Exchange "plunger" who, finding things dull in Capel Court, and hearing of big operations in Mincing Lane, got a "tip" in pepper. Visiting the sale rooms and inspecting the samples, he is said to have given an order for "1,000 tons" of his selection. The remarks of the broker are not recorded. Though dealings are, it need hardly be said, not quite on this colossal scale, there is plenty of excitement to be had in the various produce markets which centre in the Commercial Sale Rooms. The sale of a consignment of tea last week at the astonishing price of 107s. per pound has attracted a good deal of attention to these markets, and revealed interesting possibilities of business and profits of which little is generally known.

Mincing Lane is not as exclusive as the Stock Exchange, and the general public are admitted to the sale rooms if accompanied by a member. On the ground floor is a large hall with a few circular seats surrounding the iron columns of the building. Boards on the walls for quotations and telegrams complete the furnishing, and at one end of the room at a lower level is a spacious refreshment room and bar. Tea seems the favourite beverage in the afternoon, as befits the locality.

The sale rooms, of which there are several, with distinctive numbers, are on the upper floor. Each is fitted with a rostrum, and the desks and seats ranged in a semi-circle and sloping upwards afford an uninterrupted view for all members presented. Catalogues are printed for each sale, but the samples which have been offered for inspection and tasting—in the case of tea—previously are not shown at the time of dealing. The noise and excitement during the bidding far exceed the ordinary notions of sales such as are gleaned from a visit to Christie's or other auction rooms A strong dash of the betting ring seem to be here infused, and the eagerness of the bids is accounted for by the large amounts at stake. The presiding genius in our sketch is Mr. Capel, of Messrs. Arthur Capel and Co., known as the Father of the Tea Trade, and among the other members several of the leading *habitues* of the rooms will be recognised.

With reference to the special consignment of tea which has created so much interest, we learn that it was comprised in boxes of 5 lb. each consigned to this market from the Gallebodde Estate, Ceylon. Great care had been expended in its production, and the price at which it was knocked down yielded, it appears, a profit to the purchaser, who succeeded in reselling it in the course of the day £5 10s per pound. It is calculated that this represents a cost to the consumer of 1s 7d per cup, which would not be an out-of-the-way price for many descriptions of wine.

CEYLON TEA AT 110s.

Tea at one hundred and ten shillings a pound! It appears that on Tuesday last a consignment of Ceylon tea of superb quality was put up for sale in the City of London, which experts pronounced to be the finest article of the kind ever offered under the hammer. The competition for this unique specimen was so keen that the greatest excitement was occasioned by it, and the lot was at last knocked down at eighty-seven shillings per pound—a figure which during the present century had never been approached in the annals of the tea trade in this or any other country. A letter which appeared yesterday from Messrs. Whitworth, Hillyard, and Wade states, however that they were the purchasers at auction of this marvellous consignment, for which they gave eighty-seven shillings a pound, and that they have since resold it at one hundred and ten shillings—at which figure its cost to the consumer would be about one shilling and sevenpence a cup. Untiring care and attention must undoubtedly have been bestowed on its growth and preparation in the Gallebodde district of Ceylon, as the leaves are of the brightest golden colour, almost resembling small lance-shaped pieces of the precious metal. We wonder what Dr. Johnson would have thought of serious business men who, at the end of the nineteenth century, would consent to purchase at the fancy price of five pounds ten shillings per pound that leaf which when infused with hot water he loved so well to drink! There is nothing more astonishing than the rapid growth in the consumption of tea by the population of these islands. In 1840, for instance, the tea imported into this country amounted to thirty-eight million pounds, while thirty years later it it had grown to one hundred and forty-one millions, and last year it reached nearly one hundred and ninety millions. While our lively neighbours across the Channel and our kinsfolk on the other side of the Atlantic clamour for coffee as the only non-alcoholic beverage which is worth drinking, and denounce tea as "cat-lap" fit only for invalids, the teapot becomes annually more and more of a British institution.

It was one of the best and most sagacious provisions made by Mr. Disraeli in his unfortunate Budget of 1852, which brought Lord Derby's first Administration to a disastrous close, that he suggested a large reduction in the tea duty. On accepting office as Chancellor of the Exchequer Mr. Disraeli found the tea duty at two shillings and twopence farthing in the pound, which he proposed to reduce to one shilling and tenpence. Upon succeeding to the Exchequer Mr. Gladstone accepted his predecessor's proposal, remarking in 1853 that he would have gladly reduced the duty by a shilling but for the condition of the Chinese Empire, which was not as favourable to a large extension of supply, as he could have wished. "We cannot," remarked Mr. Gladstone, "entertain sanguine expectations that any very large additions to the quantity of Chinese tea available for the wants of this market will be forthcoming in the next twelve months; but we hope that in a couple of years from now an adequate increase of supply may be relied on from the Celestial Empire." In a subsequent Budget Mr. Gladstone reduced the duty from one-and-tenpence to one-and-fivepence in the pound, but it was not until 1863 that, holding up in his left hand a small packet of tea marked one shilling and fivepence, and in his right hand a much larger packet marked one shilling, Mr. Gladstone showed in his Budget of that year how much the reduction of the duty from one shilling and fivepence to one shilling in the pound would redound to the advantage of the purchaser. Two years later the shilling duty was further reduced to sixpence, and so remained until in his last Budget Mr. Goschen made a further concession of twopence in the pound. The result is that the consumption of tea in the United Kingdom has kept pace steadily with the successive diminution in the duty which, catering for the poorest classes of the population, it is the ambition and policy of each successive Chancellor of the Exchequer to continue. Every one is aware that excellent tea is now to be obtained at two shillings, or even at one and sixpence per pound, and it will startle the humble consumer to read that more than one hundred shillings per pound have just been paid for a consignment from Ceylon. In his recent speech at Hawarden, Mr. Gladstone stated that tea now cost one-quarter, and sugar one-sixth, of the price they commanded fifty years ago. Tea, in its rapid advance to ever-increasing popularity, has never been exposed to the attack by which coffee was at first assailed. Thus, we read in Messrs. Thornbury and Walford's "Old and New London" that the rainbow Tavern in Fleet-street was the second coffee-house opened in the Metropolis. Four years before the Restoration, William Farr, a barber, began to offer coffee for sale next door to the Rainbow, trusting to the young barristers in the

Temple for support. It was not to be expected' however, that the vintners and liquor-sellers in that bibulous neighbourhood would submit tamely to the introduction of a non-alcoholic beverage. Pretending that their neighbours disliked the smell of the roasting coffee, the Bonifaces of Fleet-street indicted Farr as a public nuisance, and endeavoured to force him to shut up his shop. The indomitable barber, nevertheless, persevered in the teeth of their opposition, and the "Arabian drink" soon became amazingly popular. A satirist, who sympathised with the good old drinking days, was compelled to write regretfully: "And now, alas! the drink has credit got, And he's no gentleman that drinks it not."

Although tea was much slower than the "Arabian berry" in "catching on" with the public, yet having once made a start it soon outstripped its more exciting brother. On the 28th of September, 1660, Samuel Pepys writes in his "Diary": "I did send for a cup of tee, a China drink of which I never had tasted before"; and a little later he adds that, on reaching home, he found his wife engaged in making "tee"—"a drink which Mr. Pelling, the potticary, tolls her is good for her cold and defluxions." At that time the price of a pound of "tee," which was almost universally pronounced "tay," was from six pounds sterling to ten pounds; and the consumption was sufficient in 1669 to induce the East India Company to import "the new commodity" for the first time. Their importations came straight from the Flowery Land; but in 1666 Lord Arlington brought over a large consignment from Holland, and sold it as a particular favour to his friends at sixty shillings a pound. It is reported, indeed, by Mr. John Timbs that the first cup of tea ever made in London was drunk by Lord Arlington in Buckingham House, which stood on the site now occupied by Buckingham Palace. Following his Lordship's example, Garraway, the founder of the celebrated coffee-house in Exchange-alley, issued a shop-bill proclaiming that "Tea hath already been sold in England in the leaf for six pounds and sometimes for ten pounds the poundweight, and in respect of its former dearness hath only been used as a regalia at great feasts and entertainments. The said Thomas Garraway did therefore purchase a quantity thereof, and sold it in the leaf from sixteen to fifty shillings in the pound, making it into a drink, according to the directions of the most knowing merchants and travellers into those Eastern realms; and upon experience of his continued care and industry in obtaining the best tea and making drink thereof, very many noblemen, gentlemen of quality, and physicians have sent to him for the same leaf, and daily resort to his house to drink thereof." The experienced tavern-keeper well understood what is often forgotten in these days—that no one can make a cup of good tea without bestowing time, thought, and attention upon the brewing thereof. The demand for tea in now so enormous that other countries have come into competition with China, and more of the leaf is imported from India than from the Celestial Empire. Last year Ceylon alone supplied nearly thirty-three million pounds out of our total consumption of about six times that amount. The amazing price just given for Ceylon tea will undoubtedly stamp it as the best in the world. The Chinese drink has superseded the Arabian to such an extent that there are said to be five consumers of tea against one of coffee in the United Kingdom; and so abundant are the sources of production whence this necessary commodity can be drawn in the future that there is little danger of the humble tea-drinker having to give a higher price for "the cup which cheers yet not inebriates" than she has paid in the past. There is but one country—Australia—which, relatively to population, is a larger tea-drinker than the United Kingdom, seeing that at the Antipodes the annual consumption is at the rate of nearly eight pounds per head, while in this country it is rather less than five. We trust that the tea-planters of India and Ceylon will be encouraged by this extraordinary sale to aim at quality as well as quantity in their future productions.—*Daily Telegraph*, Jan. 17th.

THE HILL-COUNTRY PLANTING REPORT.

MARVELLOUS SALE OF GALLEBODDE GOLDEN TIPS

has brought me the following letter from Col. H. Byrde:—

"Goytry, W. Pontypool, Jan. 22nd.

"In case you should not have received an article published in the *Daily Telegraph* upon a sale of tea from Gallebodde, I venture upon the privilege of old associations and 'ancient' friendship gives me, to send it to you as a clipping from the paper, and as likely to be interesting to you personally, and to the many readers of your valuable paper who are now engaged in the new enterprize of tea cultivation, in which, I am thankful to say, that I have a small interest, for it seems part of my happiness to be still engaged in some enterprise in a country where I began to plant coffee at Black Forest now 55 years ago, and in which I have never been without some agricultural interest.

"Alas! one after another of our old friends are called to their rest, and only last week my dear old and valued friend and brother officer for many years, was called home, Major-General Wm. T. Layard, one of the most genial and pleasant men the Rifles ever found, an excellent officer and a good Christian. We were subalterns together and were associated in after life, and while I mourn the loss of a friend, I cannot but feel that he is one more gone to the heavenly home, whither we shall soon follow.

"I have been glad to see from time to time that you are still blessed with health and strength for the duties of life, and I am thankful for the same blessing, and am actively engaged in County Council work and Magisterial duties, and feel that I, too, should soon 'subside' had I no longer an abundance of work to do; and your weekly issue is more and more valuable as years pass on."

It is surely interesting to know that there is a man living who commenced

COFFEE PLANTING FIFTY-FIVE YEARS AGO,

and who, having seen the collapse of the once great enterprise, with which, from its beginning, his family was so closely connected, has survived to have an interest in what promises to be the still greater enterprise of tea. My own connection with forest pioneering and coffee planting dates back to just the half-century. I was in the Ambagamuwa jungles, then only touched by the axe on their outskirts, in May 1840. In December of that year I entered Uva; and by May I had cut the boundaries of nearly 4,000 acres and "put in" a couple of nurseries. The article sent by Col. Byrde (which you will insert in the proper place) is interesting. We cannot, however, meet the wishes of English writers by *growing* golden tips any more than the superintendent of a coffee plantation could obey a proprietor who ordered him to

GROW ONLY PEABERRY.

They have a similar story in Australia of the owner of a pastoral run who gave instructions that only "wethers" were to be bred. The crusade against coffee on its first introduction as a beverage reminds me that in my boyhood I read in one of Mrs. Trimmer's books of advice to domestic servants to avoid tea as they would poison and to stick to good honest beer! As an advertisement this astonishing sale of Gallebodde tips must further

THE INTERESTS OF CEYLON TEA,

and I suppose the entrance of Sir Graeme Elphinstone and Messrs. Figg and Powell Jones into the directorate of Horniman's Tea Company indicates that henceforward Ceylon tea will be more largely than ever distributed by that firm.

PLUMBAGO MINING IN CEYLON BY A NEW COMPANY.

Mr. A. Y. Daniel, Auctioneer and Commission Agent, writes:—"I have to report sale this day by auction of 17 tons uncured plumbago belonging to the Gemming and Mining Co. of Ceylon, Limited at R185 per ton."

A NOVEL ADVERTISEMENT FOR CEYLON TEA.

Our contemporary of the London *Daily Graphic* must, we should think, have been somewhat "cornered" for a subject for its illustrations when it gave place to what, it must be presumed, was a *post factum* sketch of the scene in the Mincing Lane tea-sale rooms on the occasion of the bidding for the lot of Gallebodde tea which has recently fetched such remarkable and previously unheard-of prices. However, there can be no reason why we should decline to welcome such an advertisement of our teas. It will, doubtless, have done much to attract public attention to the high excellence of our island produce, and will almost certainly have induced many to give it a trial—a trial which we may feel confident will go far towards extending the popular taste for Ceylon tea which has been of such rapid spread throughout Great Britain.

Nor, while giving prominence to this particular instance of pictorial advertisement of a group of excited gentlemen all anxious to become the buyers of what is perhaps in itself only a curiosity, should we overlook what has become the subsequent career of the tea itself. Our London correspondent gave us previously a letter to the editor of the *Times* broaching the subject, and he has since sent us an advertisement inserted in the same journal by the United Kingdom Tea Company which was the buyer at second hand and at the unprecedented price for tea of £5 10s 0d per pound, inviting the visit of the curious in such matters to view the sample. Both these notices cannot fail to receive much of public attention, and they must consequently, whilst economically advertising the purchasing Company, enlarge the borders of the popular estimation in which Ceylon tea is held. For all this "much thanks" to the proprietors and manager of the Gallebodde estate! It must remain, however, a moot point, whether those gentlemen will have benefited themselves in anything like the same degree that they have benefited the industry of which they are representative. Our home correspondent quotes to us the opinion of a well-known expert on the subject of this lot of tea, that this particular lot of tea can only have been produced by the sacrifice of the quality of a considerable portion of the estate production. We are informed that the full payment made by the Company above referred to was about £80. At the rate of £5 10s the pound it is evident that about 15 lb. of this special sample must have been brought together, and some feel curious to know how large was the bulk of tea which must have been depreciated in value to obtain this quantity of "golden leaf." That term may be used advisedly—though, in a commercial sense, it may be misapplied, because, on being viewed "the sample looked like small wiry pieces of gold."

Altogether, we feel inclined to remark with the French General who witnessed the grand charge of the Light Brigade at Balaclava that "*C'est magnifique, mais ce n'est pas la guerre.*" Another French saying occurs to us in this connexion as aptly applying to this venture, and that is that perhaps "*Le jeu ne vaut pas la chandelle.*" That is, however, only immediately a matter for the consideration of the proprietors of Gallebodde. The community will be quite content to accept the probable good results to our industry without caring to raise the question of the purely economic value of the act. But lest other among our planters should be induced to follow their example, it appears desirable that we should ask them to bear in mind that although this special lot has secured a price which will doubtless compensate its growers for their trouble and for the depreciation of some bulk of their produce, any who might be induced to imitate them can by no means rely on future efforts of the kind meeting with equal success. It was the novelty, no doubt, which excited the strong competition witnessed to become the possessors of this abnormal parcel of tea, and it is scarcely likely, we should say, that even a second lot appearing in the market would obtain anything like equivalent prices or attract the public attention in the way this lot has done.

It is amusing to note the ignorance that has been shown at home as to the method by which this fine specimen of our tea has been produced. The *Investors' Guardian* has remarked with respect to it, that "with *connoisseurs* in tea, able and willing to pay such prices, planters should be encouraged to cultivate the finest varieties with the greatest care." All the home papers which have noticed this particular sale have written of it in somewhat similar terms, and it is evidently the widely-diffused opinion at home that this tea has been the result of a specially careful form of cultivation; as, also, that the price paid for it has been due to appreciation by tea *drinkers.* Both of those conclusions we here in Ceylon know to be fallacious. However cultivated the taste for tea may be, and however appreciative of high merit in the leaf, it is not likely that a drink which would cost the consumers, we are told, something like 1s 9d the cup of infusion would obtain purchasers. This lot of Gallebodde tea, as we have said, must be regarded only as a curiosity. Multiplication of such lots would deprive them of that qualification and they would no longer serve the purpose of advertisement, either for individual estates or for individual companies or firms. Tea planting must, to be successful, be conducted on purely commercial and not on æsthetic principles. To the latter class we should assign the classification of this curious specimen of Ceylon tea.

RAINFALL IN LOWER MASKELIYA.

ANALYSIS OF RETURNS FOR THEBERTON AND ELFINDALE ESTATES.

NANUOYA, Feb. 10th.

On the rainfall map of Ceylon, issued with the Surveyor-General's Meteorological Report, the deepest shade of colour marks a comparatively limited space near the centre of our mountain region, if we include the scattered "foot-hills" and detached ranges in the south and east, where the mean annual rainfall is 200 inches per annum and over. In this spot, at the foot of Adam's Peak and along the rivers which flow into the Kelani Valley, the three recording stations are Theberton with an average of 217 inches, Kandaloya 205, and Sembawatta 205. The altitudes at which the observations on these places are taken are:—Theberton, Maskeliya, 3,315 feet; Kandaloya, Yakdessa, 2,400;

Sembawatta, Nawalapitiya, 1,500 feet. It will thus be seen that the altitudes at which the rain-clouds chiefly strike the sides of the mountain ranges in Ceylon and have their vapour condensed into rain vary from 1,500 to 3,300 feet above sea-level. In India the rainiest station, Cherapunji, is at an altitude of about 4,300 feet on the side of the Himalayas; and were an observatory situated at an equal elevation near Adam's Peak, its mean annual rainfall would probably amount to 300 inches, against nearly double that quantity at the Assam station, the rainiest on the globe. Meantime, from fi ures which have reached me, it seems that ELFINDALE, at 3,000 feet elevation, and about ⅝ of a mile S. W. of Laxapanagala, which, itself, rises about 3,000 feet still higher and is distinguished by a series of formidable cliffs, ought to be included and given first place amongst

THE RAINEST POSITIONS IN CEYLON.

Like Theberton it is situated on the side of a valley down which run a series of parallel rivers which have their origin on the Peak ranges, and along which the rain-laden winds of the S.-W. monsoon sweep, depositing liberally their pluvial treasures. From figures for 5 years, with which Mr. Grigg of Theberton has favoured me, it results that the average annual rainfall of Elfindale is no less than 246·45 inches. In the first year of the series, 1886, the quantity which fell closely approached 300 inches,—the actual figures being 294·52 inches. Of this quantity 96·86 came in the first half of the year, with no less than 197·66 in the latter half. In the 4 months June to Sept. of that year, the deposit of condensed moisture was represented by such figures as the following :—

June ..	39·64	inches
July ..	42·59	„
Aug. ..	66·72	„
Sept. ..	41·08	„

Total for 4 months 190 03 inches. A

WET PERIOD

certainly! There is no rainless month in the record, but Feb. 1888 had only 40 cents against an average of 2·21 inches. The highest average 48·36 inches is against June. The variations in the annual rainfall at Elfindale have been from the maximum of 294·52 in 1886 to the minimum of 211·77 in 1889. But there has been no falling-off such as Mr. George Grieg has experienced on Laxapana, for the rainfall of 1890 was 249·33 inches, or 3 inches in excess of the average. The annual average for Elfindale being 246·45, the monthly averages are :—January 2.27 ; February 2·21 ; March 4·90 ; April 13·31 ; May 26·46 and June 48·36 ; the average for the first half of the year being 97·53 inches. In the second half of the year, the averages are: — July 33·74 ; August 35 21 ; September 33·16 ; October 27 09 ; November 12·53 and December 71 8. So much for Elfindale, which would seem to receive

MORE RAIN THAN THEBERTON

in proportion to its nigher proximity to the great cloud-cooler Laxapanagala. Against ⅝ of a mile S.-W. of this great and steep mountain, in the case of Elfindale, the rain-gauge at Theberton bungalow bears W. S.-W. from the mountain, distance one mile, with an elevation higher by 315 feet than that of Elfindale. For the 5 years ended 1889 the average rainfall of Theberton was 217·08 inches For the sunspot period of 11 years, to end of 1890, the average is 221·11 inches ; 82·54 for the first half of the year and 138 57 for the second half. In the 11 years the variations in the annual rainfall have been from 184·10 in 1885, the lowest, to 287·39 in 1882, a year of excessive rain in Dimbula as well as in districts nearer the Peak and its ranges. When we come to

THE HEAVIEST RAINFALL IN ONE MONTH,

Theberton, we believe, beats the record, with 78·81 inches in June 1888, the figure for the whole of that year being however, somewhat below the average, viz : 216·81 against 221·11. It is curious to notice how inequalities are reduced or raised so as to give a return to averages. The excessive rainfall of 1882, when the figure was 287·39, was followed by 205 73 for 1883 ; 194·40 for 1884 ; and 184·10 for 1885. Then came a reaction in 1866 to 258·30, followed by 213·80 for 1887. In the past 5 years the rainfall has been below the average, going down to 197·21 in 1890. But there has been no reduction of the general average, to compare with that which Mr. George Greig lately reported from the neighbouring Luxapana estate. There is a Laxapanagala estate, from which we should like to see returns. In 1890 the rain was measured at Theberton Factory, which is at 3,000 feet elevation, against 3,315 at the bungalow, and distant only ⅝ of a mile from Laxapanagala, against 1 mile in the case of the bungalow. The result was 208·84 inches at the store, against 197 21 at the bungalow, a difference of more than 11 inches. This shows the influence of

POSITION AND TOPOGRAPHICAL FEATURES,

with reference to rainfall. The monthly averages, established by 11 years' observations at Theberton bungalow, are :—Jan. 2·28 ; Feb. 2·87 ; March 6·14 ; April 9·45 ; May 21·58 ; June 40·19 ; July 30·98 ; Aug. 33·76; Sept. 24·33 ; Oct. 27·17 ; Nov. 13·50; and Dec. 8·82. With a record of 5 years' observations, Elfindale, with an annual average of 246·45 inches, is

T E RAINIEST CEYLON ESTATE

of which we have any authentic knowledge, but we repeat our conviction that in some places on the slopes of the Peak and its flanking ranges, Laxapanagala, &c., the annual average must be up to 300. We heard some years ago before it was established that tea could flourish not only in 70 inches per annum, but in 300,—that observations taken on some estates were suppressed for fear of impressions injurious to such estates being formed. To Mr. Grigg's credit it is that he has always published the exact truth regarding the rainfall on Theberton ; and now equally authentic figures enable us to say that on one tea estate in Ceylon at least the annual average rainfall is close on 250 inches. Let us now hear Mr. Grigg himself on these interesting returns In sending them, he wrote :—

"I send you Elfindale rainfall for 5 years and mine at Theberton bungalow for 11 years and at my Factory for 1890. Also a rough sketch of how the rain-gauges stand as to the big Laxapanagala range, the highest peak of which stands above, at some 3,000 to 4,000 ft. (The exact height of the peak has never been properly taken, as it was said by the surveyors, it was impossible to get on the top of it to place a trig which they wanted to do ; so they have never bothered to get its height correctly. Last year, however, the Peak was scaled by three young fellows, and a flag placed on the top, distant from Theberton bungalow about one mile, as that old bird the crow flies.) The factory gauge is ⅝ mile from peak. Elfindale gauge ⅝ mile from the peak. All are nearly in a straight line from the highest point, which bears W. S -W. Taking the W. N.-W. wind draught up the valley, this would deflect the S.-W. monsoon rain current to about W.S.-W., or right across our rain-gauges. You will note that Elfindale average for 5

years is 246·45 inches; Theberton for 11 years 221·11,—an increase to Elfindale of 25·34 mean., by being closer to the mountain. 1890 rainfall gave more viz.:—

Elfindale	249·33
Theberton Factory	208·84
Bungalow	197·21

I expect the increase to the nearer station to the mountain would be more or less, as the S.-W. monsoon has more or less southing or westing in it, or maybe when it is stronger, so carrying rain clouds further off. I believe if a gauge was kept on Laxapanagala say ½ mile west of Elfindale, it would show a much heavier rain fall than Elfindale. Strange at Laxapanagala bungalow, which is about a mile in a straight line N.-W. from Elfindale, the rainfall is said to be less. This is accounted for by the mountain decreasing in elevation as it runs to the west, below Laxapanagala falls. I should say, they had a much better climate than here, that is still further west—as I note the sun shining often there when we are all cloud and mist here. Though I see in today's *Observer* that at Arslena (which is lower down in Dikoya Valley) the rainfall is very heavy.* The main reason our rainfall being so heavy the hot air is carried right on to the mountain from off the lowcountry without any hills of any considerable elevation taking the moisture out of the S.-W. current. I rather fancy the S.-W. about middle Maskeliya travels across a lot of high land, which wrings the moisture out of it before it falls in the Valley. I trust I am not intruding by sending you these notes. As I know you take great interest in these things I thought you might like to see them. If you think it worth while you might send these notes on to Colombo, Mr. Greig of Laxapana having sent you notes of his rainfall, I thought you would also like to see ours, which in a way are unique. Mr. Galton of Elfindale kindly gave me his rainfall for 5 years. The rainfall has been kept off and on on Elfindale for many years, but I am afraid previous to r. Galton's, they are not to be relied on; besides they were kept at the bungalow, which is right under the Laxapanagala cliffs, and I believe the rainfall there was very large. Unfortunately the returns could not have been kept regularly. Tea flushing very well. We have had a lot of red spider and mosquito blight; but since the nice showers we have had this week, the pests are disappearing. Thunder storm last night in S.-W. Looks at present (Feb. 6th) like more rain.

I am sorry to see my good friend Mr. Grigg's reference to red spider and *helopeltis* as having given him trouble. I do not attach much importance to the former, so far as I have seen or heard of it in Ceylon, It seems to come and go away, without doing much harm. The contrary seems to be the case in India, as witness the following extract from a Darjiling letter in the *Indian Planters' Gazette*:—

Mr. Christison, the General Manager of the Lebong Tea Company, has been carrying on a series of experiments with sulphur as an insecticide with especial reference to red spider, which has been working such a vast amount of havoc on very many tea estates in this district. Mr. Christison has always gone thoroughly into everything he takes up since he came to the district, something like thirty years ago, and as he is particularly well up in matters connected with agriculture, the results of his investigations, carried out as they have been during a number of years, over a very large acreage, and very accurately noted are deserving of weighty consideration in all the tea districts. After trying all probable cures for red spider blight, such as tobacco, juice, lime water, kerosine oil, soap suds, and mud and water Mr. Christison found sulphur by far the best remedy for this pest. He has been using it since 1879 up to the present time, and over an area of about 400 acres, so that the trial has been an exceedingly extensive one, and may be looked on as having passed well beyond the merely experimental stage into that of sound practice. This year the Lebong Company's gardens are being sulphured in downright earnest, as no less than 15 tons (a large order indeed) of it have been procured for the special annihilation of the spider. The sulphur is liberally applied to the bushes in the following manner, which certainly has the advantage of being very simple indeed. As soon as the spider begins to show any signs of life, or when there is a longish spell of dry weather without any wind large garden syringes are brought into use; with these the bushes leaves, stems, branches and all are thoroughly syringed with water, the powdered sulphur is then thoroughly dusted all over the bushes out of a canister or a gauze bag. If no rain falls for some time after the bushes have been sulphured, all the better; so that it is of importance that an appropriate time of year should be chosen, say, from January to the end of April. The advantage of this sulphuring the bushes is that it is inexpensive, is at all events handy, and the requisite labour for carrying out the work is, generally speaking, more available during the cold weather, and up till the end of April, which is a very important point. Mr. Christison tells me that his treatment has a wonderful effect, far exceeding any other cure. The plant so thrives and grows after it for three years that one would almost think it acted as a manure, in addition to killing the spider entirely the first year. The pest does return after three years, but by that time the plants have become invigorated to some extent and can the better grow out of the spiders' attacks. Mr. Christison is inclined to think that in three years the capital expended in sulphuring the bushes will be returned in increased outturn with about 15 per cent. extra, and that the plants at the end of that time will have been vastly improved. The fumes of the sulphur can be smelt from afar as one passes by, 300 yards off, and even can be detected in the factory in April and May. The result of the brokers' valuations and of actual sales have not shown that there has been any deterioration in the quality of the tea sent to market; and as a matter of fact, the fumes have entirely gone off before the tea is finally packed. These carefully observed and recorded facts are deserving the attention of all interested in tea manufacture, and I commend it to their notice through the medium of your columns.

The application of sulphur, after the fashion described, ought to be equally efficacious, I should say, against the "mosquito blight," which, from what I saw of the savages of *helopeltis* in Java and what I have read from its terrible effects on the yield of Indian tea plantations, I consider much the more formidable

ENEMY OF THE TEA PLANT

and the tea planter. But as Mr. Grigg's mention of "the spider and the fly" (beetle, rather) is the first I have seen or heard of for a long time, I trust the attack noticed is isolated, and that it will neither recur nor spread. Up in this region, there is not the slightest trace of any insect or fungoid plague, except a little moss on the stems of the bushes and a little bronzing of old leaves which is of no consequence. Even the moth, which at one time, some years ago, gave trouble in curling up the flush, seems to have entirely disappeared.

* 226·43 inches against 249·33 on Elfindale.

KEEPING MACHINERY FROM RUSTING.—A mechanic says that in order to keep machinery from rusting he takes one ounce of camphor and dissolves it in a pound of melted lard, taking off the scum, and mixing in as much fine black lead as will give it colour. The machinery is then cleaned and smeared with this mixture. After 24 hours the machinery is rubbed clean with soft linen cloth, and it will keep clean for months. The same artisan gives the following method of hardening tools: Forge the tool into shape, then melt in a dish sufficient Babbitt metal to cover the end of the tool as far as it is wished to harden it. Thrust the tool into the metal and let it cool. This method makes the tool much harder than cooling in oil or tempering by any other process.—*Chicago Tribune.*

MR. HUGHES AND TEA ANALYSES AND "RAG" MANURE.

Meeting Mr. John Hughes this week, the question was put to him by me as to whether he had yet been commissioned to make the analyses of tea respecting which he had been in communication with your Planters' Association, and which, it seems to be the general opinion, might be productive of very valuable results. Mr. Hughes told me that he had received a very polite letter in acknowledgement of his offered terms for doing this, but that it contained no instructions to undertake the work.

That gentleman further told me that he had at length heard something as to the result to the application of the "rag" manure on the Mariawatte estate. He said he had heard from Mr. Rutherford that, having been applied side by side with a patch which had been treated with cattle manure, the trees on the latter had borne much the more freely. This apparently discouraging result must, however, be largely discounted, for Mr. Hughes observed to me:—"You will recollect when we first talked upon this subject that I told you that one reason why I had recommended a trial of this manure was because it had been ascertained to be so slow in its action. All my experience goes to show that if rapidly forcing manures can be avoided it is invariably better for the cultivation. Now with English farming it is a necessity to use fertilizers that are rapid in their action, that will yield up their constituents to the soil as quickly as possible. When you consider how few months are available for farming here at home, you will see that there is no time available for slow decomposition to work. Horse and cow manure is always allowed a certain amount of decomposition before use in order that it may commence yielding up directly it is applied to the ground, and this accounts mainly for the storage in manure heaps for a long time in advance of actual use. The use of farm litter, too, is largely subsidized in England by mineral manures, such as sulphate of ammonia and nitrate of soda, both of which begin to work directly they are applied. But there is no necessity for you out in Ceylon to demand such quick action. It is always injurious to *force* anything in nature, and as you have a climate in which your tea bushes can take up nourishment throughout the whole year, it is in my opinion much better to attain results gradually and not to use forcing mixtures. That is the reason why I yet think—in spite of the apparently disadvantageous comparison to be seen on Mariatwate—that the owners of that estate may yet come to acknowledge the superior value of this new manure. I admit that it is twice as bulky as are most mineral manures, and that that constitutes an objection; but on the other hand I believe that mineral manures are very ill-suited to the conditions available under the climate of Ceylon."

COFFEE AND CINCHONA CULTURE.

During our conversation we touched upon the decadence of your coffee and cinchona cultivations. Mr. Hughes said he had never believed in the latter being well adapted to Ceylon soils. These soils were far and away, he said, inferior to those of India for the growth of those trees, and he had not been surprised to hear of the numbers of them which had died out after a certain age of growth. In reply to a question as to what he thought of the probable permanence of tea cultivation, Mr. Hughes expressed the opinion that it had every chance of it. "Indeed," he went on to say, "tea seems to me to be just the very thing for Ceylon planting. What do you specially observe as the chief characteristic of Ceylon scenery? It is essentially *green*, that is to say luxuriance of leaf pervades the island. Nature therefore teaches you that to produce leaf is almost certain to be the industry to which it will lend itself in Ceylon. It don't seem to me that a berry like coffee would be as suitable or as reliable as tea, and as to cinchona I have already told you what I think about it. Rely upon it, both the climate and soil of Ceylon are the best adapted for tea. It is essentially a *leaf* island."—London *Cor.*

MANA GRASS EXPERIMENTS.

Calling in at Messrs. Curtis & Harvey's this week, one of the partners obligingly told me that he had just been to their mills at Hounslow that he had seen the charcoal burned from the ton of mana grass, and that the outturn was satisfactory both as to quantity and as to quality. "But," he said, "I can't give you any opinion as to the suitability of the grass for our purposes until some has actually been made into gunpowder. We expect to commence doing this very shortly, and you shall know the result of our first trials with it."—London *Cor.*

NOTES ON PRODUCE AND FINANCE.

REDUCTION OF DUTY ON TEA INCREASES CONSUMPTION.—That this is the case is fully proved by the fresh strides which have been made in the consumption of tea during the past year as a result of the lowering of the duty in May last to 4d per lb. Prior to the reduction of duty the increase in the consumption was very small last year, but in 1890 it may be said to have suddenly started forward, and the total for that period was 8,386,692 lb. above the corresponding one in 1889.

MINCING LANE BUOYANT.—In Mincing Lane the easy state of the money market has largely increased the speculative business in produce. In the tea market there is much animation, and the volume of business in this article passing through the Produce Clearing House is heavier than at any time since this institution was first used as the channel for speculative dealings. Prices have daily advanced, and now show a very important rise since the commencement of the year.

THE DECLINE AND FALL OF THE CHINA TEA TRADE.—China is sadly worsted in the tea competition by Indian and Ceylon. The exports of tea show a falling off of 6 per cent against the corresponding quarter of last year.

During the past year a survey of the industries of Lower Burmah has been made, and a Provincial Board is deputed to consider these and advise the Indian Government as to the best means of promoting technical and scientific education in that province.—*Globe.*

COFFEE IN COORG.—There is very little crop, for sale, and the owners of coffee are holding out for 300 rupees a Candy, *i.e.*, quarter of a ton. Intending purchasers fight shy, and don't want to be liberal in the price they will pay. In the meanwhile there is said to be no money in the country, and all trade is driven to the winds. The people are also suffering by reason of the loss of their paddy crops.—*Bangalore Spectator.*

Mr. J. D. Pasteur, Inspector of the Post and Telegraph Service of Java, has sent to Dr. T. A. Jentinck a teak telegraph pole from the Kediri Residency, Java, which in spite of its iron hardness has been pierced with holes, near where the insulators were attached, by the beaks of a local woodpecker (*Picus analis*). These holes are also made in the living kapok trees (*Eriodendron anfractuosum*), which are utilised as telegraph poles in Java. In Norway the like thing has occurred, and it is supposed the birds have mistaken the humming of the wire for a nest of insects inside. Large cairns used to prop up telegraph poles in Norway have also been scattered by bears, perhaps for a similar reason.—*Globe.*

THE HOREKELLY ESTATE COMPANY, LTD.: ANNUAL MEETING.

The annual general meeting of shareholders was held at the Company's office this day at 1-45 p.m., Mr. F.C. Loos in the chair, and there were also present Messrs. A. Schulze, Staniforth Green, F. C. Loos, W. B. Baring, F. J. De Saram, E. W. Suhren, V. A. Julius, Stanley Bois, Wm. Law, and R. L. M. Brown (Secretary). The following were represented by their attornies:—Henry Bois, W. J. Carver E. Christian, E. Daendliker, F. W. Bois, Mrs. F. W. Bois, J. B. Alston, Alexander Gibson, W. G. Ingles and executors of the late Mr. E. Robinson.

THE CHAIRMAN'S SPEECH.

The minutes of the last meeting having been read and confirmed,

The CHAIRMAN said that shareholders would have observed from the report that the expenditure for last year had been somewhat reduced in comparison with that of the preceding year—the expenditure for the year 1889 being R32,448·77, while that for 1890 was R29,492 09. There had been a slight increase in the quantity of copra produced, but there was a noticeable diminution in the quantity of coir fibre made—43,358 ballots having been turned out for 1889, whereas the outturn for 1890 was only 21,850 ballots—the decrease of production being due to the difficulty of finding an outlet for the fibre, which caused the quantity produced to show a large failing-off. There was one important matter connected with the estate which was worthy of remark, and that was that the Directors had f r years past been applying manure to the different parts of the estate, and they found that the return was commensurate with the amount of money spent in applying this manure. The thing had, however, not been done systematically during the previous years, but from this year they intend doing this experiment systematically, and he had no doubt that this statement would meet with the approval of the shareholders. He needed scarcely remark that the more manure they applied to their estates, the greater would be the yield and the larger would be their dividend. With these remarks he begged to move the adoption of the Report. (Applause)

DIVIDEND.

The CHAIRMAN said that the next matter was to declare a dividend, whereupon on the motion of Mr. V. A. JULIUS, seconded by Mr. WM. LAW, it was resolved that a dividend of 5 per cent on the paid up capital be declared.

APPOINTMENT OF DIRECTORS.

Mr. BARING moved that Mr. F. J. De Saram be re-elected Director and Mr Percy Bois be elected in the room of Mr. P. Daendliker, the retiring Director—Seconded and carried.

APPOINTMENT OF AUDITOR.

The CHAIRMAN said that they had to elect an Auditor in the room of Mr. S. T. Richmond who was eligible for re-election. He had satisfactorily discharged the audits of his office and he begged to move that Mr. S. T. Richmond be re-elected.—Carried.

THE COMPANY'S REGULATIONS.

The CHAIRMAN said that before they separated he desired to draw the attention of the members to the Company's articles of association, which required the attendance of 17 shareholders to form a quorum. The quorum was formed under the Joint Stock Companies Ordinance; but he thought that seven or eight shareholders would be quite sufficient to convene a meeting. He intimated that he would bring forward a special resolution on the subject for the purpose of reducing the quorum of shareholders in view of the difficulty such as they had experienced that day in obtaining a quorum under the ordinance.

This concluded the business of the meeting.

REPORT OF DIRECTORS.

1.—From the accounts for 1890 now submitted it will be seen that the profit on the year's working amounts to R19,986·17. Depreciation of plant and machinery at the usual rate has been deducted—viz., R2,009·04, thus leaving (with the balance of R419·11 brought forward from 1889) a sum of R18,396·24 at the credit of profit and loss.

2.—The Directors recommend that a dividend at the rate of five per cent on the paid up capital be declared. This will absorb R17,567, and leave a balance of R829·24 to be carried forward to 1891.

3.—The Crop of the past year must be considered as satisfactory in view of the very short rainfall and prolonged drought, while the Directors are happy to report that the prospects for 1891 point to an increased yield over 1890, if normal weather be experienced

4.—The difficulty of finding an outlet for coir fibre has caused the quantity produced to shew a large falling off, but the production can at any time be increased as opportunities arise for its dispsoal.

5.—The working of the two seasons, 1889 and 1890 compares as follows (the item of interest being excluded):—

		1889	1890
Expenditure on estate and in Colombo Office		R32,448·77	29,492·09
Quantity of Copra produced ...	Candies	805	941
Do Coir Fibre made ..	Ballots	43,358	21,850
Average price obtained for Copra per candy ...		R39·36	39·94
Agerage price obtained for Coir Fibre per cwt. ...		R4·54	6·16

BALANCE SHEET MADE UP TO 31ST DEC. 1890.

Dr.

Capital and Liabilities.	R	c.
I. To Capital—		
1,542 Shares at R100...	154,200	00
50 do 90...	4,500	00
2,408 do 80	192,640	00
4,000	351,340	00
II. To Debts and Liabilities of the Company—		
Loan on Mortgage	75,000	00
Balance due for wages to Coolies, Contractors, &c., at 31st December	1,469	96
Sundry Credit Balances	181	02
Directors' and Auditor's Fees	1,433	33
	7884	312
VI. To Profit and Loss Account—		
Balance of this Account ...	18,396	4
	447,820	5

Cr.

Property and Assets.	R	c.
III. By Property held by the Company—		
Immovable Property:		
Land under Cultivation and reserved ...	306,400	00
Buildings and Permanent Works ...	37,958	71
	344,358	71
Movable Property:		
Plant and Machinery	80,361	97
Less written off for Depreciation ...	2,009	04
	78,352	93
Stock-in-Trade:		
26 Cattle on Estate	458	00
190 candies 381 lb. Copra	7,318	17
8,238 ballots Coir and Bristle Fibre ...	3,386	25
Steel, Oil, Iron, &c.	1,144	76
Manure account, crop 1891	646	44
Rice in Store	337	00
	13,290	62
IV. By Debts owing to the Company—(considered good)		
For Work and Payments on account 1891	1,193	62
V. By Cash—		
In Bank of Madras on current account	10,622	90
In Secretary's hands	1	77
	10,624	67
	R447,820	55

REVENUE AND EXPENDITURE ACCOUNT FOR THE YEAR ENDING 31ST DEC. 1890.

Expenditure.	R	c.
Colombo Office Expenses—		
Directors' Fees	1,333	33
Managing Director's and Secretary's Fees ...	1,666	65
Auditor's Fee	100	00
Postages, Stationery, Advertising, &c. ...	110	31
	3,210	29

Interest	3,870	65
Estate Expenditure—		
Superintendent's Salary, Coolies' Wages, Miscellaneous Expenditure	26,281	80
Balance to Profit and Loss account ...	20,188	00
	R53,550	74

Revenue.	R	c.
Sales of Copra	37,583	10
" Coir Fibre	15,946	64
	53,529	74
Transfer Fees	21	00
	R53,550	74

PROFIT AND LOSS ACCOUNT FOR THE YEAR ENDING 31st DEC. 1890.

1889		R	c.
Sept. 15th	To Interim Dividend at 2 per cent. account 1889	7,026	80
1890			
March 31st	To Final Dividend at 2 per cent. account 1889	7,026	80
		14,053	60
	To Balance	419	11
		14,472	71
Dec. 31st	To Amount written off for Depreciation of Plant and Machinery ...	2,009	04
	To Loss on Shipment	265	08
	" Balance	18,396	24
		R20,670	36
1889		R	c.
Dec. 31st	By Balance	14,472	71
		R14,472	71
1890			
March 31st	By Balance	419	11
Dec. 31st	" Balance of Revenue and Expenditure account	20,188	00
	" Recoveries of Bad Debts ...	63	25
		R20,670	36

E. & O. E.

Audited and found correct, (Signed) S. T. Richmond, Auditor.

(Signed) F. C. Loos, Chairman. E. Christian, F. J. De Saram, and P. Daendliker, Directors. R. Lewis M. Brown, Secretary.

Colombo, 29th January 1891.

CATTLE AND SALT.

The following occurence which has come within the scorpe of my observation is not only amusing but also shows how CATTLE are found of SALT especially up here on these hills in the interior where there is little chance of the sea-water spray being carried up by high winds to be deposited on the land in spite of the fact the saltpans at Hambantota can be seen from the Haputale Pass. A man in charge of a cricket groen in this neighbourhood told me that instead of moving the grass on it he had reccurse to a much easier plan to make the ground smooth and even. He said he could get the cattle to do it all for him and proceeded to show me how. He took some salt-water and sprinkled it on the green; and what was my surprise to see a number of cattle grazing in the adjoining patana shoving each other and rushing up to the spot where the water was sprinkled and eating off the grass wi h great avidity, biting it almost to the very root! By thus spinkling saltwater cattle could be made to graze even on coarse grass which they would otherwise loathe.

The United States Government has appointed a commission to investigate the subject of the irrigation of the States west of the Missouri. The data collected show that no less than two-fifths of the entire area of the United States is arid and dependent on irrigation for profitable farming.—*Globe*.

STENNING, INSKIPP & CO.'S INDIAN AND CEYLON TEA MARKET REVIEW FOR 1890.

ESTIMATED SUPPLY AND DELIVERY to end of Season 1890-91, and probable Stock on 1st June next—

1st June, 1890, to 31st May, 1891.

	Supply.	Delivery.
Indian	103,000,000	101,500,000
Ceylon	52,000,000	45,500,000
China, Java, &c....	73,000,000	82,000,000

	Stock.		1890. Stock.
Indian	29,000,000	against	27,490,000
Ceylon	16,000,000	"	9,590,000
China, Java, &c....	30,000,000	"	41,000,000

[No reasons are given for estimating a consumption of 101,000,000 lb. Indian out of 103,000,000 imported, while of 52,000,000 Ceylon imported only 45,500,000 will be used. Why should there be in 1891, a result so different to that obtained in 1890? And why should it be taken for granted that the deliveries of China, Java, &c., should exceed the imports by 9,000,000 lb? We can have no confidence in such an estimate.—ED. *T A.*]

EXCHANGE.—The rise in exchange has caused much concern to planters, more especially to owners of those estates which have experienced bad weather, but the fact must not be lost sight of that this rise has been the means of diminishing the China export, thus helping to strengthen the market for Indian Tea, the common grades in particular being benefited.

REDUCTION OF DUTY.—The Tea Duty was reduced on 1st May from 6d per lb. to 4d per lb. The effect has been to enhance the value of common and medium descriptions, more especially Pekoe Souchongs, which are now very largely used by blenders for supplying both retailers and the packet trade.

[A table shows that the home consumption of Indian and Ceylon teas went up from 28,013,000 lb. in 1877, or 18$\frac{5}{8}$ per cent of the whole, to 136,500,000 or 70$\frac{1}{2}$ per cent in 1890. China, meantime, went down from 123,012,000 lb. to 57,500,000. The increase in consumption in 1890 over 1877 was 44,000,000,—the figure for 1890 being 195,000,000 against 151,025,000 in 1877, a period of 14 years. In 5 years the rise was from 174,665,000 in 1866 to 195,000 in 1890, an increase of 20$\frac{1}{2}$ millions, or at the rate of 4 millions per annum. The increase being mainly in Indian and Ceylon, may safely be calculated at 6 millions per annum China standard. —ED. *T. A.*]

CEYLON.

THE COURSE OF THE MARKET.—Business commenced with a good demad, but heavy Auctions supervening together with less desirable quality, caused a lower range of prices, except for a few choice Teas. No change occurred until March, when supplies fell off, and with better quality the demand improved, and values advanced until May, when the enquiry somewhat slackened, but only for a short time, as business again became active; in July the prices of less desirable qualities went weaker; good liquoring Teas were unchanged. Arrivals were smaller in August, and an advance took place which was well maintained until October, when less activity was apparent, and in November a decline, due to a poorer selection, occurred, but the year closed with a firmer tone.

QUALITY.—Has shown a distinct improvement on that of last year, the fermentation having been better than hitherto; flavoury Teas have commanded very satisfactory prices, especially when with thickness of liquor. Owing to the scarcity and dearness of the higher grades of China Tea, it is very probable that the persistent efforts to introduce Ceylon Teas into the Continent, as well as into other countries, will meet with more success before long.

DELIVERIES.—From 1st June to 31st December deliveries show an increase of 5,706,000 lb., as compared with 6,336,000 lb. same period in 1889. For the 12 months, 1st January to 31st December, the increase is 7,486,000 lb., as compared with 11,615,000 lb. in 1889. We think the cause of this reduction in the rate of increase is due chiefly to the higher range of values for the commoner grades.

EXPORT.—It is calculated that the crop 1st January to 31st December, 1891, will be about 52,750,000 lb., and that the present area under cultivation may produce in 1894 a total of 74,000,000 lb. The subsequent yearly increase will probably not be very large.

		Average Price.			per lb. s. d.
1890	...	535,611	packages, average		0 $10\frac{3}{4}$
1889	...	431,043	do	do	0 11
1888	...	303,284	do	do	0 $11\frac{1}{4}$
1887	...	182,955	do	do	1 $0\frac{3}{4}$
1886	...	101,145	do	do	1 1
1885	...	58,921	do	do	1 $3\frac{1}{2}$

[In the 5 years between 1887 and 1890, the deliveries of Ceylon tea nearly quadrupled, rising from 9,942,000 lb. in 1887 to 37,652,000 in 1890.—ED. *T. A.*]

DAVIDSON'S DOWN-DRAFT SIROCCO.

(*To the Editor, Indian Planters' Gazette.*)

SIR,—Your issue of 20th instant contains yet another letter from "Darjeeling," *re* my Down-draft Sirocco, and I am glad to see by it the steady manner in which he is continuing to withdraw one by one, each of his original complaints, until the list of his grievances is now reduced to his inability, as he describes it, "to add 2 to 6 annas per lb in value over tea dried by charcoal." This complaint somewhat reminds me of the man who, after having purchased a type-writing machine, said it was a failure, and wanted to return it, because it did not make any improvement in his spelling!! But in still further support of my statements that the down-draft sirocco, *when properly used*, does produce the highest class qualities of tea, I may quote the following extract from a letter from a well-known Ceylon Planter addressed to me to Belfast and which I have only just received.

"After an experience of 18 months of the original small Down-draft Sirocco and $4\frac{1}{2}$ months of the larger one, I am of opinion that these machines are capable of developing a very high quality of tea, while for convenience of working and economy of fuel I know no machine equal to them." (Signed.) J. N. CAMPBELL. Moray Tea Estate, Maskeliya, Ceylon, 12th Nov. 1890.

Mr. Campbell's teas have been selling at the remarkably high average of fifteen pence, and his factory is in the Hills, and at even a higher elevation than that of Darjeeling, and turns out upwards of 4,000 maunds of tea per annum, so that his experience has been gained in the manufacture of much larger quantities of tea than anything "Darjeeling" has had to do with. But "Darjeeling" in his letter under reply objects so emphatically to my quoting testimonials emanating from Assam, Cachar, Sylhet and the Terai, that he will probably also object to my citing any from Ceylon, in which case there is evidently nothing left for me but to quote *a testimonial from "Darjeeling" himself* as to the general efficiency of the Down-draft Sirocco. This testimonial is embodied in a letter which he, "Darjeeling," in his own proper name, addressed to me personally to Belfast shortly after my Engineer's second visit to his place, and which letter has been forwarded on to me here, it having arrived in Belfast after I had started for India. It is dated—Darjeeling, 21st October 1890, and the following is one of his paragraphs in full, word for word—"I do not wish to run down the Sirocco, which is an admirable machine *and, I believe, the best that has yet been brought out*, but all machines are susceptible of improvement."

He then goes on to give me his ideas of what those improvements should be, and, while I thank him or laying them before me, I must nevertheless decline to accept them in the light of "improvements." For instance, he has a special fancy for putting a *small* pipe on the air exit from the fan. The open area of this pipe he indicates as about 64 square inches, and he says "it does not in the least obstruct the escape of air from the fan." I, however, found it necessary to make this opening with an area of 200 square miles, and yet he reduces it by *more than two-thirds* and wants me to consider this an "improvement!" If it be so, then why not go on reducing it and thereby increase the improvement, till perfection is reached by closing it entirely? I am, however, well pleased with the testimony "Darjeeling" has given me as to the general merits of the Down-draft. To be the "*best* tea-drier that has yet been brought out" is no mean praise to bestow on it.

I feel, Mr. Editor, that I have again trespassed too far upon your valuable space, but I anticipate that in your appreciation of fair play you will excuse me seeing that, throughout this correspondence, I have been, and am still, only defending myself and my inventions against the groundless attacks of men who if they possessed the courage of their opinions, ought not to have been afraid, or ashamed, to put their own names to their letters.—I am, Sir, yours faithfully,

C. S. DAVIDSON.

Calcutta, 23rd January 1891.

[The mass of evidence and independent testimony which Mr. Davidson has adduced in his several letters so fully proves the truthfulness of the statements, published in his advertisements, that we feel sure even "Darjeeling" himself must be now convinced he has been mistaken, and we consider this correspondence may now be closed.—ED., *I. P. G.*]

THE TEA MARKET.

The correspondence in the *Grocer*, discloses the fact that a new element has been introduced into the tea trade, and that there are now, as in other markets, operators for the fall, who are interested as speculators in depressing prices. Facilities for selling "bears," for delivery at a future date, have been given by the inclusion of tea among the articles of produce dealt in through the London Clearing House. Transactions are based upon a "type" of which samples are supplied to all who wish to deal either as buyers for the rise or as sellers for the fall. A "call" is held every day, sometimes twice a day, and prices fluctuate according as buyers or sellers predominate. Operators settle differences on open contracts day by day with the Clearing House as prices change; and as the Clearing House has power to close any operators' account on failure to pay up the difference due, speculation is considered to be made safer, and confined more strictly to those who have means available for the prompt liquidation of losses. On this ground, the formation of the Clearing House is justified by those who support it either as shareholders or as speculative operators through its agency. But a very different view of the whole matter is held by many of the older and most important firms of tea brokers, who (supported by the principle producers, their clients) have steadily refused to associate themselves with the movement or to transact this kind of business, which they deem prejudicial to the best interests of producers. There is reason to think that the value of tea was depreciated unduly in the autumn by the action of speculative sellers, who calculated on lowering prices by persistent selling of tea which at the time had existence only on paper. The "bears," however—who acted on imperfect information, and altogether failed to grasp the altered position of tea—have been caught short of stock, and their efforts to buy back what they have sold have led to a rapid advance in the terminal market. The principal buyers, who have practically cornered the market, are reputed to be substantial firms connected with China. They are strong enough to carry the speculation through, and have now a numerous following of smaller

men, outsiders, and others whose eyes are opened to the remarkable position of tea. The heavy deficiency from China—about twenty-five million pounds—and the short crop from India, have brought to pass what we have always been told is impossible, viz., a real deficiency in the total supply required for the world's consumption. From no source can the scarcity which is beginning to be felt be relieved until the closing months of this year. Hitherto these speculative transactions have been very limited in Indian tea, for the "bears" hesitated to sell; but it is on record that in December the type was quoted under 8d, below its value on the basis of public sale rates, and those who did so have now the option of covering at 10d, or of risking still heavier loss. The situation, from whatever point of view regarded, is an interesting one; as, quite apart from the results of speculation, the elements exist for a rise in the value of tea—possibly of permanent duration—exceeding the hopes of the most sanguine; rivalling, it may be, the extraordinary rise in the value of coffee which was brought about a few years ago by a somewhat similar series of events. When it is remembered that the price of sound China Congou is still only 7½d per lb.; good Indian Pekoe Souchong about 10 l per lb; really good Pekoes at 1s; and fine tea at 1s 6d, it is clear that there is *room* for improvement, provided there is sufficient *reason* for it, without fear of any material check to consumption.

In the issue of the *Grocer* of the 24th "Broker," replying to letters depreciating tea writes:—

"A Wholesale Dealer," into whose motives we need not enquire, has done his best through your columns to depreciate the value of tea, and has warned your readers against the tactics of speculators, to whom he is pleased to attribute the upward movement of price.

As a representative of producers largely interested in the steadiness of the market, I ask you to let me join issue with this "Wholesale Dealer," notwithstanding that I cannot claim to be specially anxious for the welfare of your readers. On behalf of those who hold strong views about the market, let me say that their basis is this:—

1. The ascertainment that supplies from all sources this season will be at least 15,000,000 lb. less than our requirements, and possibly 20,000,000 lb. less.

2. The knowledge, derived from the most influential sources, that the retailers throughout the country are lightly stocked, and cannot long hold out against rising prices.

3. The opinion that, with the exception of the commonest qualities, teas are at very low prices in the wholesale market as compared with the prices in retail trade, leaving margin for a considerable advance.

4. The fact that home consumption is rapidly increasing, as shown by the duty payments on nearly two and a half million pounds more than last year, between the dates of Jan. 1st to 20th, following on the very considerable increase during 1890.

5. The impression, based on careful enquiry, that the public are largely buying a better kind of tea than before duty was lowered, taking their two pence out in "quality."

6. Experience of the commercial history of the world which teaches us that articles shipped from silver-using countries, in the long run, rise and fall with the movements, in the silver market. With the rupee and the dollar at their present price, it is certain that "common tea" must either rise on price or cease to be produced. The efforts of Indian and Ceylon growers are being turned towards making "finer tea and less of it," in order to combat the higher cost of their crops caused by the rise in silver.

7. The knowledge that (outside the Clearing House clique) there are no speculative holders of tea at all —speaking, of course, in general terms. If "Wholesale Dealer" knows where tea is held as a speculation, perhaps he will indicate it; if the stocks held by dealers who have had the foresight to acquire them be referred to, they are merely the set-off against those who have run short in the hope of prices falling.

In conclusion, let me say why the Indian sales have been so large: it is because Indian importers have been advised for years to sell freely whenever demand is strong and on general principles irrespective of prices or statistics; and they have acted on this advice. Having sold 745,000 packages out of the 1,150,000 packages which will be received, they will now be advised to sell the balance quietly between now and July, and take the average of the market for sales spread over that period.—*H. and C. Mail.*

THE VISIT OF MR. POPOFF, THE RUSSIAN TEA BUYER.—We learn from Mr. Popoff, the Russian tea merchant who arrived here on Friday evening from Marseilles in the "Salazie," and concerning whom we had a paragraph in our last issue, that he purposes staying only a short time in Ceylon prior to proceeding to China on his yearly business visit to the tea markets there. He is accompanied on his tour by Madame Popoff and Mr. Jaeger, and wishes to see one or more of the crack tea properties in the island. He brings letters of introduction to Messrs Aitken, Spence & Co. and they will, no doubt, help him to do this, and no doubt the system of pruning adopted by our planters will be shewn him, as it seems he considers it a matter of special interest. When in China he hopes to visit the tea gardens, and to see for himself what chances there may be for amendment in manufacture of tea in that country. He is somewhat reticent as to his opinion on the chances of Ceylon tea in the Russian markets. This is perhaps only natural under the circumstances, but we may form our own opinions from the hint he throws out—that it is quite possible that the next time he visits Ceylon he may remain a much longer time and not go on to China at all. He met Mr. Rogivue in Moscow and gives a good report of his health and spirits, and speaks highly of his abilities. Before very long we may hope to see Mr. Popoff or his agent resident in Colombo and buying our best teas for direct export to Russian markets.—Local "Times."

GEMMING IN RAKWANE.—Feb. 16th.—A large and successful sale of gems took place at Botiatenne on the 11th instant, several gem merchants from Colombo, Morotuwa, Ratnapura and other places being present at the sale. Among the lots sold, a very valuable sapphire weighing 53 carats was briskly competed for and was eventually purchased by one Mr. Fernando of Morotuwa for R2,700. Besides this gem, two other lots of sapphires were sold for R263 and R204 respectively. Tamby Sinho, the famous gemmer of Rakwane, was the happy finder of these gems, though for some time past he has spent a lot of money without finding a stone of any value. The gems in question were found on Botiatenne, bordering Golden Grove, and there is not the semblance of a doubt but that equally good, and probably better, gems will be found in the grounds of Golden Grove acquired by the Gemming Company. The vicinity has been long known as a spot abounding in gems, and all those that know the place are quite confident that, should operations be commenced there, they would be crowned with success. A few months back a rare sapphire weighing about 20 carats was found at a place close to Golden Grove and eventually fetched about R2,500. It will be very gratifying for all concerned to hear that after all the money spent by Mr. Siedle in the Botiatenne pit he is in a fair way of meeting with success. Under the able management of his present superintendent, Mr. G. H. Carey, a very large quantity of excellent *illum* of the right sort has been raised, all hands are now basily engaged in washing it, and there is every probability of Mr. Siedle meeting with very successful results. The plumbago pit on Barra estate does not seem to yield such a large quantity of plumbago as was anticipated is first, but it is said that a very rich vein of plumbago at in existence at the spot, just on the vicinity of Rakwane. The reports that are received about the finding of gems on Rangwelletenne estate are not very encouraging and most of the gems found are not very valuable.—*Rakwana Cor.*—Local "Times."

TEA CULTIVATION AND RESULTS IN UPPER AMBAGAMUWA.

Our tabular statement of the results of Tea Cultivation in East Matale, has brought us another paper from the other side of the country, namely Upper Ambagamuwa, and the figures there given will surely astonish old planters of coffee in that region. The comparison, too, with even the most favoured districts of the country is very favourable, both for heavy outturn of crop, and economy in working. It will be observed that the Ambagamuwa estate has a splendid rainfall, no less than 210 inches in 1890. The information given in regard to manuring will be carefully considered. Similar statements for typical estates in other districts would be very interesting and useful to men anxious to compare expenditure and receipts. Our correspondent writes :—

It may interest your readers to compare results from the quartz and clay of Ambagamuwa with those from the alluvial deposits of the Matale district in which our friends seem to delight on that side of the country. The following are the figures of crop and expenditure of this estate for 1890, viz :—

Cost per lb. of made tea f. o. b. on—Upper Ambagamuwa—384 acres at lb. 366 per acre, equal to 140,742 lb., at 26·35 cents, equal to R37,094·80 ; plus new clearings· 97, equal to R1,366 29, at 27·32 cents, equal to R38,461·09 total expenditure on estate.

			Cents	R	c
GENERAL EXPENDITURE.					
Salaries and Allowances	140,742 lb.	at	3·89	5,481	60
Contingencies	do	do	·43	587	76
Tools	do	do	·08	109	22
Grass fields	do	do	·06	94	21
Fire Insurance	do	do	·21	300	00
	do	do	4·67	6 572	79
UPKEEP OF BUILDINGS.					
Machinery ...	do	do	·20	287	95
Tea Factory ...	do	do	·10	128	85
Bungalow ...	do	do	·35	432	03
Supplying ...	do	do	·01	26	39
Manuring ...	do	do	·01	9	91
Lines ...	do	do	·06	93	50
	do	do	·73	1,028	63
TEA CULTIVATION					
Roads and Drains ...	do	do	·37	526	51
Weeding ...	do	do	3·28	4,608	00
Pruning ...	do	do	·86	1,214	77
	do	do	4·51	6,349	28
TEA MANUFACTURE					
Plucking ...	do	do	9·29	13,077	98
Firewood ...	do	do	·43	586	19
Factory Labour ...	do	do	1·33	1,869	51
Factory Sundries ...	do	do	·15	207	41
Packing Materials ...	do	do	3·57	5,026	78
Transports ...	do	do	1·68	2,376	20
Tea Manufacture ...	do	do	16·44	23,144	10
Tea Cultivation ...	do	do	4·51	6,349	28
Upkeep of Buildings ...	do	do	·73	1,028	63
General Expenditure ...	do	do	4·67	6,572	79
Cost against Crop ...	do	do	26·35	37,094	80
New Tea Clearings ...	do	do	·97	1,366	29
	do		Ct. 27·32	R38,461	09

The following figures show the yield per acre, from a field Mookalam (¾ grown jungle) planted in 1880 and all dug over (forked) at end 1883, with the result that it gave 1,004 lb. made tea per acre in 1884. It gave

	lb.			lb.	
In 1882...	450	per acre	1887....	677	per acre
'83....	672	do	'88....	589	do
'84 .	1004	do	'89....	856	do
'85....	605	do	'90....	662	do
'86....	530	do			

9 years' average lb. per acre 671½ equal, to 6,045 lb.

Notwithstanding the big yield of 1,004 lb. per acre the year after it was dug, I am of opinion that the field would have shown better results during the 9 years had it not been dug. I believe in digging when the soil can be thatched immediately after, or on flat land, such as Dumbara, Lower Matale, or Kurunegala.

RAINFALL FOR 1890.

	inch.		inch.
January	·68	July	22·58
February	6·61	August	16·46
March	3·47	September	32·12
April	16·52	October	26·04
May	18·98	November	16·58
June	35·38	December	5·57
	81·64		119·35
			81·64
		Total	200·99 inch.

WYNAAD PLANTING NOTES: COFFEE.

Planting has, I regret to say, become of late such a truly dismal subject, that I have positively shied at the idea of discussing it. At present the tiniest rim of silver comes to edge our cloud, for the weather has been unusually propitious, and the spike looks exceedingly promising. It is very dry and hot with us now. The regular old fashion winter suitable for hardening wood and spike, is so far very desirable. But of course such parching heat is very trying to new clearings, and our cattle are suffering terribly already. There has been a tolerably severe outbreak of foot and mouth disease, and this morning I hear of some cases of rinderpest on a neighbouring estate.

I can but give you a woeful account of our past crop season. With the exception of one or two estates, the crop has been past all the experience of the "oldest inhabitant," for badness. Properties which might reasonably have expected 100 tons, have only given 14 and most of us humble ourselves to the level of from 1 to 3 ton crop—and this scarcity has not been alone confined to coffee; pepper has also failed, and the cinchona disease has ravaged splendid fields, in a heart-breaking manner. Paddy has also been very poor and the natives, like ourselves, suffer keenly from the general badness of the times. There is, however, considerable trust still in Ledgeriana cinchona. Formerly it was considered the most delicate variety, but it has proved the contrary and remains healthy in situations where the *succirubra* has died out wholesale. Unfortunately, the bark market is anything but cheering at present. In fact, Mark Tapley would be in his element in Wynaad just now, and I do think we deserve credit for being as jolly as we are under very decidedly discouraging circumstances. It seems to me that pepper, Liberian coffee, and Ledger are our principal supports; but even more than these, undoubtedly, thrives *tea*. There are very many of us whose thoughts are turning seriously to this product. It has been proved beyond a doubt that tea grows splendidly in Wynaad and yields infinitely more freely than on the Nilgiri hills. The difficulties put forward regarding it, are the labour or the capital necessary for starting a new industry, and building factories for the preparation of the leaf. There is a great difference of opinion on the labour question, some pointing out the difficulty we already find in obtaining sufficient hands for working our estates during three-quarters of the year, whilst tea requires a continual and regular supply; others saying that a little extra pay will bring in what we require.—*Cor., Madras Times*, Feb. 16th.

NILGIRI TEA.—It is expected that there will be a grand harvest for Nilgiri tea planters this year. A correspondent writes:—"That very good tea (equal to the produce of Ceylon and Assam) can be produced on these hills has lately been proved by several of our planters. Nilgiri planters require to carefully prune their bushes; to pluck quickly and fine, and to provide ample withering accommodation. 500 pounds per acre is possible on these hills to the careful agriculturist."—*M. Mail.*

BARK AND DRUG REPORT.

(From the *Chemist and Druggist.*)

LONDON, Feb. 5th.

ANNATTO. Seeds are firmly held, though the price still remains low. For a parcel of 90 bags good bright red Ceylon an offer of 2d per lb. was refused, as being ½d below the limit. Twenty-one bags good West Indian seed sold, "subject to approval," at 2¼d per lb.; damages at 1d per lb.

CINCHONA.—A parcel of 112 bales South American Guaiaquil bark was for the greater part sold today at a decline of about 2d per lb.; bright thin silvery quill 10d to 11d; broken ditto 7d to 8½d; long brown, partly broken quill 5d to 5½d; broken brown stout ditto, and damaged 3½d to 4½d. For a parcel of 45 bales so-called Calisaya, fair bright colour, half hard bald, imported via Hamburg, the price of 9d per lb. was suggested. Sixteen cases East Indian bark, long thin bright druggists' quill, partly mossy Succirubra, sold at 11½d to 12d; and for 13 cases good grey stem quill 1s 2d to 1s 4d per lb was paid.

COCA LEAVES.—Six bales South American leaves were bought in—good greenish but broken Truxillo, of good flavour, at 1s 3d per lb.; thin dull small grey leaves, at 9d per lb.; 8 packages, just arrived from Colombo, were not actually offered.

QUININE.—There has been more business doing this week, about 110,000 oz of German speculative brands, in bulk, having sold for forward delivery (July-September) at 1s per oz. At today's auctions 8,000 oz. Brunswick and 5,000 oz. Zimmer quinine were offered, but only 11d per oz. was bid for them, and the whole was bought in. There are second-hand sellers on the spot at 11¼d per oz.

AGRICULTURAL AND TECHNICAL EDUCATION IN THE COLONIES

is the title of a paper by Henry F. Moore, read at the latest meeting of the Royal Colonial Institute, in which we find the following from Ceylon :—

CEYLON.

The Colonial Secretary, Sir Edward Noel Walker, K.C.M.G., has sent me the following excellent report :—

I. General Education.—The population of Ceylon, according to the last census (1881), is 2,759,738. For this population general education is provided in connection with the Government as follows :—

(*a*) 438 schools, with 35,948 scholars, supported wholly by Government.

(*b*) 919 schools, with 66,400 scholars, aided by Government: the Government paying a grant on the result payment system after the annual examination of each school.

There are also 2,427 schools receiving no aid from the Government, representing 28,823 scholars. Of these 1,844 schools, with 12,211 scholars, are Pansala schools —i. e. small schools taught by Buddhist monks in their monasteries. The teaching of English was at one time largely carried on by the Government direct in its own Government schools. It has of late years, however, become in a fair way to be self-supporting; and the schools supported wholly by Government are now nearly all vernacular schools, teaching, *in Sinhalese and Tamil only*, reading, writing, arithmetic, geography and history, with specific subjects (animal physiology, sanitation, agriculture, and domestic economy). The teaching of English schools aided by Government, but not wholly supported by Government, is on the following lines in high schools, the whole of the instruction being given in English; in English primary schools the subjects are taught up to the fifth standard bi-lingually—what is read or written in English having to be translated into one of the vernacular languages, so that a native scholar may gain a full understanding of what is taught.

II. Agricultural Teaching.—(*a*) Generally, the elements of agriculture are taught as a specific subject in Government and aided schools from text-books.

(*b*) Five years ago a special school of agriculture, wholly maintained by the Government, was opened at Colombo, and the students undergo a two years' course of training somewhat on the lines of Cirencester.

After their training is completed, a certain number are paid by the Government, and are sent out as agricultural instructors into remote rural districts, where they lease land and cultivate it on improved systems, receiving half the profits of their crops themselves, the other half being divided amongst the labourers from the village where the cultivation is worked. By this means, what is learned in text-books at school is brought before the eyes of the villagers. I have not been long at work in this direction, as the experiment is new; but some good has been done already in the few years that have been devoted to it, especially as the crops raised by our instructors have generally been double, and often many fold, of the crops raised on primitive native systems; this provokes imitation. These agricultural instructors are moved about the country after raising a few crops, so as to bring their work before as many villages as possible.

PLANTING PRODUCTS.

(*From the Thirty-seventh Annual Report of the Ceylon Planters' Association, held 17th Feb. 1891.*)

Tea.—The season on the whole has been a satisfactory one especially so in the continued progress made in Markets proving the usefulness of the Tea Fund which paves the way to the introduction of our Teas to all parts of the world. The Ceylon Planters' American Tea Company has been amalgamated with a large American Company and there is every promise of its diverting a considerable share of your Tea to America. A very promising beginning has been made in introducing Ceylon Tea into Russia and you have to thank Mr. Rogivue, who was sent there by the Standing Committee of the Tea Fund, for the very energetic way in which he has set to work. Your best thanks are also due to Lieut. de Frisch for his kind aid in bringing our Tea into notice in Russia, and everything points to considerable progress being made in this Market during 1891. You are also led to expect the advent of Russian buyers to the Colombo Market, and it must be seen to that Teas are sent forward to suit them, which will settle the matter of opening the Russian Market at once. The average for the Home Market was 11d, the same as that of last year; but the Market differed this year from last in that it was a steady one throughout the rise in silver during the latter half of the year, without any compensating rise in the marke value of your Teas has of course been a serioust matter, and growers must trust to the great and increasing demand for our teas to right this in time. The working results of all local Tea Companies have been satisfactory showing excellent returns. The total crop for the year ending 31st December 1890 is 45,799,518¾ lb. or an increase of 11,453,766 lb. as against the same twelve mouths of 1889. The progress made with the Australian and New Zealand markets continues to be most satisfactory, the exports for 1888 being 479,626 lb, for 1889 1,134,156 lb. while for 1890 they are 2,361,433 lb., or more than doubling itself each year. Your Teas taken up by America and Canada for 1890 are 204,223 lb. as against 42,252 in 1889. There has been a considerable increase of Tea coming into bearing during the year and the area now giving yield may be put at 205,000 acres. 1891 will show a still larger increase on this. Tea in many districts has had to suffer from an insufficiency of rain during the South-West Monsoon but owing to the first portion of the year being so favorable the falling off in returns has not been great. A considerable number of properties have changed hands during the year at satisfactory prices. And the enterprise as a whole is on a firm footing with every promise for the future. A further considerable acreage has been planted in tea during the year under review in all the divisions of the principality of Uva, Badulla, Madulsima Haputale, Udapussellawa and the results obtained not only as regards yield but also as regards the quality of the tea compare very satisfactorily

with those obtained in the most favoured parts of the island. The exports for the year 1st January to 31st December 1890 were 45,799,518¾ lb. as against 34,345,752¾ lb for the year from 1st January to 31st December 1889. You are again indebted to the courtesy of the Principal Collector of Customs for authoritative data of the exports of tea from Ceylon, and your Committee has great pleasure in appending it.

Coffee.—During the twelve months there has been a slight falling off in exports of coffee. For the last three years the returns are as under:—

Exports from 1st Jan. to 31st Dec...	1888...	cwt.	137,793
Do	1889...	,,	89,694
Do	1890...	,,	90,090

Cinchona—There has not hitherto been the falling off in the production of this drug to the extent that has been expected; large quantities are yearly harvested; neither has there been any improvement in the prices realized which are still ruling at a figure at which cinchona cannot be cultivated profitably. Owing also to increased supplies from Java the Market for Cinchona throughout the past year has remained in a depressed and unsatisfactory condition, the unit of Quinine ranging from 1½ d to 1⅝d. During 1890 large areas of land have been cleared of this product more especially in the Uva Country, and tea planted in its place. Little or no planting of Cinchona has been done in Ceylon in recent years. It may thus be taken for granted that the cultivation in Ceylon is not extending. Upon one point therefore no doubt need exist, the cinchona trees are being gradually eradicated, where shaving and careful covering were performed formerly now the tree comes out roots and stem. Harvesting bark in this manner accounts for the shipments being kept up to the still existing large figures but sooner or later a rapidly falling export, will be shown in the meantime the stem and roots of an uprooted tree supplies fully four times the quantity of bark that could be obtained by merely spoke shaving a portion, and thus chiefly, are the large exports maintained. The exports for the year 1st January to 31st December 1890. were 8,779,140 lb against 9,455,641 lb in 1889, 12,482,817 lb. in 1888. Showing a falling of 5,896,523 lb. in 1890 over the year 1886 when 14,675,663 lb. were shipped.

Cacao.—The recurrence of droughts particularly in the older planted districts has affected the out-turn of crop very considerably, and the export has not been so large as last year being cwt. 4,073 short of 1889. The younger districts though fairly realizing estimates have not made up for the deficiencies elsewhere. Helopeltis, Borer, and the other pests continue to give trouble in their season, but the gardens generally are looking well. There has been no great addition to the area cultivated but some pretty extensive clearings about Wattegama have been commenced. The thefts of this product have become very numerous and serious, involving a great deal of trouble and hardship upon managers as well as loss to proprietors. The receivers of stolen produce hardly seems to have the attention of the Police as much as they might. Prices have been satisfactory having ruled favourably during the year, in the closing months they were exceptionally high, Ceylon Cacao still mantaining the premier place in the Home Market. The Exports for the year 1st January to 31st December 1890 were 15,942 cwt, as against 18,949 cwt. for the year 1st January to 31st December 1889.

Cardamoms—Do not generally, except in the districts north of Kandy, receive the attention they did but in those parts which appear specially suited to their growth the cultivation is continued successfully and is being extended. Indeed, it may be safely said that three-fourths of the exports of this spice come from the districts lying to the north of Kandy. In the so called new districts and other parts to the south it is a rare thing to find 10 acres of land now devoted to cardamoms, while in Medamahanuwara and the Nitre Cave extensive clearings exists. It is hardly probable that cardamom cultivation will extend much further or, that the output from Ceylon in the future will greatly increase for the area of the land suited for their cultivation is not large and the rhisomes become exhausted usually after the 7th or 8th year, in the some cases before. The present figures of export may however be maintained for some years to come. The exports for the year 1st Jan. to 31st Dec. 1890 were 395,576¾ lb., against 466,168¾ lb. for the year 1st Jan. to 31st Dec. 1889.

Tobacco.—The cultivation of this product continues to be persevered with. The season has been a most unfavourable one owing to the almost unprecedented drought in all the Tobacco districts. There is no doubt that Ceylon can grow leaf of good quality and give a large yield per acre, but as was the case with our teas at first it will take a little time to find a demand, and the prices so far have not been remunerative owing no doubt partly to defective curing as well as to market prejudice, reports on the Tobacco justifying higher prices than have been obtained.

MINOR PRODUCTS:—*Cotton* has been partially successful and its cultivation is still being carried on both by Europeans and natives. In other parts of the hill country generally however the climate has proved too moist and insects too troublesome to secure any sufficient measure of success.

Croton Seed continues neglected, prices having fallen so persistently low.

Annato has been largely grown, and exported as paste and seed. The market is being overdone and good prices are not now obtainable.

Pepper is being largely planted. It seems a promising article, but so far actual returns have not met expectations.

CUBEBS.—The true plant yielding this valuable berry has still to be introduced into Ceylon, all previous introductions having turned out factitious.

ARECANUTS have cropped well and yielded good prices 1890 being "a lucky year" amongst natives; the demand was good.

KAPOK receives growing attention in the lower districts, but it is doubtful if it would pay as a systematic cultivation.

THE LABOUR LAWS.—In the last Annual Report the Committee saw occasion to congratulate the Association; because efforts which had been extended over nearly two years were thought to have terminated in a legislative measure honorable to employers and employed; and although the law unanimously agreed upon in Council was felt to be in certain points defective and incomplete, it was regarded as the best and most expedient of possible alternative amendments, and not inconsistent with the past traditions and usage which controlled the relationship of the contracting parties. Though it was mentioned in last year's Report that Royal sanction had not then been proclaimed to the Ordinance No. 13 of 1889 which had been unanimously passed in October and had indeed become an operative Law under which cases were decided in the Courts, it was a startling reverse to learn on 16th April, shortly after Council re-assembled, that a despatch dated 29th January 1890 had been received nearly two months previously, not only witholding Royal sanction, but requiring the Governor, if necessary by the vote of the official majority, and whether the official opinions concurred or not, to pass another Ordinance amending No. 13 of 1889 as to its principle. The amending Ordinance No. 7 of 1890 embodying the new principle of terminating the contract by efflux of time, instead of by the amount of work done and wages earned, was passed on 21st May 1890, was allowed by the Secretary of State on 27th June 1890, and was on 15th August 1890 proclaimed and made operative. A meeting of the Association was held in Kandy on 18th April, when the resolution expressing emphatic remonstrance, as reported in the annual proceedings, was passed; and protests with explanations were prepared by the Chairman and the Planters' Representative to be forwarded to the Secretary of State, copies of which are published, as it was felt that the true conditions could not have been fully made known to him. The Ceylon Association in London with several others there interested in Ceylon, were prepared to render such assistance as seemed practicable by means of deputations, &c. At the Committee stage of the amending Ordinance the Planting Repre-

sentative, while continuing to express strong objection to any alteration of the law of 1889, obtained an extension from 30 to 60 days for the period which may elapse after the calendar month expires wherein the wages were earned, before non-payment frees the labourer, without notice or demand, from all his obligations. In obtaining that extension of periods, the Planting Member intimated that he only accepted it as the best means of giving effect to the Secretary of State's orders, and not because he approved of or agreed to the alteration which had been forced upon the Legislative Council. With the greatest difficulty the Association, by the aid of the Planters' Representative in Council had succeeded in obtaining "a fair law with a continuity of the practice of a quarter of a century," conserving to the cooly "the privileges of a daily laborer, combined with continuity of employment" together with absolute security for his wages but the conditions of the law previously set forth in the last annual report are now varied in this, viz;—That it has been made easy for laborers indebted to the Estate to desert (labourers not in debt rarely or never desiring such opportunity), while the thrifty labourer has been in no way benefited. The avowed object of the less acceptable alternative was to provide a "self-acting" process whereby the labourer, without notice and without any preferred demand to be paid his balance of wages, could be relieved at a fixed time of his liability for obedient service; but, as is well known to practical planters, the previous conditions were just as much "self-acting" and were so upon a sounder basis, viz: the claim to be relieved after so much wages earned or work done, instead of merely time passed in nominal service. Hence the necessity for such a provision only existed in the imagination of those who in their minds confused the inability of certain Proprietors when overtaken by ruin some six years ago, to discharge promptly their liabilities, with a suppositious disinclination to do so; for it was not the case that any planter denied or questioned his duty to pay monthly wages when required so to do. Moreover the Ordinance No. 16 of 1884 had already accorded to the labourers a priority lien upon the estate for double the amount of wages which the rejected ordinance permitted to remain outstanding before the labourer could be relieved of his liability as a monthly servant. In thus reviewing the position of this vexed question your Committee cannot but regret that the Officers responsible for the government and administration of the country should have exhibited so defective a knowledge of the prevailing conditions of the case, and a bearing so unsympathetic and narrow in view towards the Planters and estate Owners as a class.

Labour Supply.—In the months of April and May owing in a great measure to the prevalence of influenza and the sickness attendant on it coming as it did when there was most leaf to be plucked the labour was greatly insufficient to the requirements, and a great loss of leaf and consequently of money was sustained by the planting community. This scarcity of labour was increased by the unprecedented and arbitrary action of the Government in wantonly stopping the Northern immigration route, and at the same time imposing vexatious quarantine regulations at Colombo. Representations were made by the Association to the Government and your Committee is pleased to record its appreciation of the very prompt and kindly attention given to the matter by his Excellency the Governor both as regards the stoppage of the Northern route and the quarantine regulations. Your Committee ventures to hope that such vexatious and disastrous checks to immigration will not again be imposed by the Government of Ceylon. Since the throwing open of the Northern route and the introduction of better quarantine arrangements the influx of Tamil immigrants into Ceylon has been considerable and the labour force of the country has been replenished as is seen by the fact that this year the arrivals exceed the departures by 38 242.

Coast Advances.—The question of coast advances has been brought before the Association and a circular has been issued by the Association, the recommendations of which will, it is hoped, commend themselves to the community.

Immigration Services.—Members are well aware that this subject of paramount importance to all Planters has occupied and continues to engage the constant and earnest consideration of your Association. The hardship, great inconvenience and loss endured in the early part of the year under review owing to the sudden uncalled for stoppage of the Immigration Service viâ the North Road is still fresh in your memory. At the same time you will remember that the Steamer Service viâ Tuticorin was rendered practically useless owing to the stringency of the quarantine regulations enforced at Colombo. The action of the Association on that occasion took the form of the following resolution which was passed unanimously at a large and representative General Meeting. "That this Association desires to express its strong condemnation of the late unprecedented action of Government in stopping Immigration on the North Road by recently withdrawing their sailing vessels that have for twenty six years been at the service of our coolies without one day's cessation and which withdrawal has unfortunately created a feeling of mistrust, and has been greatly accentuated by the stoppage of the steamer immigration service from Tuticorin to Colombo by the stringent quarantine regulations at the latter port." Your Committee has pleasure in freely recognizing the great interest and concern that His Excellency Sir Arthur Havelock has since evinced in the whole subject, and the steps taken by his Government to facilitate and where practicable increase the efficiency of the Immigration routes. This was evidenced by the Governor's asking for an expression of your opinion as to the relative advantages of the route viâ the North Road and viâ Tuticorin. Of such vital importance are both routes to your enterprise that it was felt absolutely necessary to pass the following resolution in reply. "That since the Tamils immigrate to Ceylon of their own free will it is imperatively necessary that the existing routes are kept open, and every facility given to the coolies to avail themselves of them." In acknowledging this resolution the Government stated that there was no intention on its part to withdraw any facility or accommodation now given by either route and submitted a proposal for the consideration of the Association as to the feasibility of a supplementary route for Immigrant coolies into the planting districts from ports in India to Hambantota and Wellawaya. Your Committee unanimously resolved that the opening of an alternative route for Immigrants viâ Hambantota would be of the greatest advantage to the planting districts and remitted the matter to a large sub-Committee to enquire into the feasibility of the route and to confer with the Chamber of Commerce regarding the immigration routes generally. That sub-Committee has not completed its labours nor has a report yet been presented; accordingly your Committee would recommend the re-appointment of the same sub-Committee to complete the enquiry desiderated which naturally will take sometime and careful consideration. It may be mentioned that the sub-Committee met at Kandy in November in conference with representatives of the Chamber of Commerce and passed the following resolutions:—

(I) That this sub-Committee strongly recommends the establishment of an additional immigration route viâ Hambantota and Wellawaya, provided one of the steam shipping companies will undertake steam communication between Negapatam and Hambantota.

(II) The Secretary of the Planters' Association of Ceylon be authorised to communicate with the various Steam Shipping Companies with the view of ascertaining what arrangements they are prepared to make in order to carry out the proposed new Immigration route and to collect all information in reply to the Colonial Secretary's letter of 6th November 1890 relative to the requirements in the way of accommodation and staff for the establishment of the route from Hambantota to Wellawaya.

(III) That a copy of the above resolutions be forwarded to Government and to the Ceylon Chamber of Commerce.

It is further understood that Messrs. Alstons, Scott & Co., as representing the British India Steam Navi-

gation Co., and others have been requested to address the Association direct on the subject, and to submit their views and proposals in connection with the question as early as possible.

LAZARETTO.—The opening of a lazaretto for coolies arriving at Colombo will it is hoped, increase the facilities for immigration by this route by doing away with any necessity for prolonged detention of steamers conveying coolies; and your Committee would record their appreciation of the prompt action of Government in completing the buildings when the need for doing so was recently urged upon them.

FUEL SUPPLY.—This matter has been prominently brought under your notice by the scarcity of fuel, which is absolutely necessary for the manufacture of tea in some districts. There are as is well-known large reserves of Crown forest but the arrangements so far made have not rendered it possible for the planters to avail themselves of the supply which is now in the hands of the Forest Department. The scheme proposed by that department of setting off certain plots of jungle for the use of various estates is impracticable owing to the inaccessibility of the plots and the conditions imposed. Your Committee trusts that the Government will continue to give their best attention to this important matter which might be to them a fruitful source of revenue by the employment of Sinhalese contractors obtain stores of fuel at accessible depots by the removal of some of the most stringent clauses of the Ordinance relating to the removal of timber and by the lowering of the rates on the Railway for the transport of timber develope a trade which would be beneficial to the revenue, the natives of Ceylon, and to the tea manufacturers. The rules at present in force regarding the supply of Firewood to Tea Estates in Central Province will be embodied in the Book of Proceedings for reference; they will also be found in the "Ceylon Government Gazette" No. 5014 of September 19th, 1890.

HOW MANY CUPS TO A LB. OF TEA?

It was said by a London expert when lately stating the cost per cup of Gallebodde tea sold at 110s per lb.,—"this equals 70 cups only to a lb." Now, what is the proper number of cups of tea to be got from one lb. of tea? What says Mr. Street, the Colombo expert?—*Planter*. [Mr. Street's reply to this enquiry is as follows:—"In reply to the question as to how many cups of Gallebodde Tea would go to the lb., I should say about 100 breakfast cups using the quantity of tea we do for tasting purposes. This would make a cup cost about 10½d at 87s per lb."—or 1s 1-5thd at 110s. —ED. *T. A.*]

TEA AND COFFEE.—It is noteworthy that the reason assigned for the reported increase in the demand of the Parisians for British grown tea is the high price and *inferior quality of coffee* and wine. As regards the high price of coffee, the same may be said of tea, seeing that the duty is excessive, but as to "quality," that is due entirely to the greed of the shopkeeper class, who have ruined the reputation of French coffee by abominable admixture of ingredients worse than chicory. This has been a prolific source of complaint by English travellers in France for some years past.—"Ceylon Advertiser."

GUATEMALA AND SAN SALVADOR.—According to reports which have reached Mexico, Guatemala has equipped for war with Salvador 25,000 men, who are now engaged in gathering in the coffee crop. It is added that hostilities are expected to be declared in the latter half of February, while Honduras will keep in check Costa Rica and Nicaragua if they attempt to interfere, but otherwise will also attack Salvador, which is preparing for the struggle. Both Guatemala and Salvador are stated to be endeavouring to arrange loans.—*O. Mail.*

84

CANCER AND FUNGI.—It a loose way, many persons have associated this horrible disease with the presence of a parasitic fungus, but the association has never till recently, been experimentally proved. Recently, however, Dr. Russell, of Edinburgh, availing himself of the methods of staining, now so much in use among microscopists, and by means of which different tissues and growths may be readily distinguished one from another, has succeeded in discovering fungus spores in cases of cancer. Dr. Russell considers that this fungus acts like yeast, and, like it, sets up a fermenting process, accompanied by changes in the tissues. Dr. Russell's experiments will have to be repeated by other observers, and if confirmed will lead, it is to be hoped, to some means of combatting this fearful malady.—*Gardeners' Chronicle.*

THE WEATHER AT YERCAUD.—A correspondent writes:—"We are having fine weather these few days, rather unusual for this part of the year. The hot days we had before this reminded us very much of the season in March and planters were apprehensive of there being a thorough failure of crop all round. But the few days rain we got has cheered them up not a little, although it is thought that the season was rather early. It is hoped, however, that the rains would continue; for more rain is wanted to set the blossom. The rain we had on the 19th of last month was thought to do the estates great harm, but the preset rains have tended to bring forward a lot of spikes that were backward then, and in a few days the blossoming season will be over. The weather does not yet look closed up and we are expecting more rain."—*Madras Mail.*

COFFEE SULPHATE FOR LILIES.—Rev. C. Wolley Dod stated recently in the *Garden*, and also at a meeting of the scientific committee, that he has found very good results with commoner Lilies as well as with Roses by the use of sulphate of copper as a preventive. Three pounds of sulphate of copper, which costs whole sale less than 3*d*. a pound, are dissolved in water, and two pounds of quicklime, separately. These solutions are then mixed together in ten gallons of water, and splashed upon the young growth, to which it does no harm. "I have found this also very useful for the cure of the mildew (Peronospora ficariæ), which has proved here so destructive to the large variety of Christmas Roses. Another remedy recommended for mildew is to dress the surface of the ground in early spring before growth commences with finely powdered sulphate of iron. One pound is sufficient to mix in a wheelbarrow load of soil, and will dress a large surface. I have seen this treatment recommended in the Kew Bulletin to prevent Potato blight. I have used it for Lilies, and it seems successful.—*Gardeners' Chronicle.*

THE PLANTERS' PRESENT TO THE CZAREWITCH.—The albums of views to be presented to the Czarewitch by the Planters' Association, arrived at Darawella from Colombo during the race meeting, and Mr. L. H. Kelly, the Chairman, being present on the course, a wish was expressed to see it, and he consequently showed it to the Governor and the Czarewitch, informing the latter that it was intended for formal presentation to him in Colombo. H. I. H. however, expressed his willingness to take it at once, remarking that he appreciated the gift very much and would prize it. The presentation consequently took place on the spot. On the silver plate outside the characters "Ceylon, 1891" appeared, and on the inside in gold lettering the fact that it is the gift of the Planters' Association to H. I. H. is recorded. Fourteen of the views show all stages of the tea industries and are those taken by the late Mr. Malcolm Clarke. Some 22 others are by Messrs. Skeen & Co., comprising views of Colombo, Kandy, Nuwara Eliya, tea estates, &c. They are all mounted on black plates with gold edge, and their description is printed below each in gold. The 100 lb. tea in 25 boxes of Ceylon woods like the present, which was given to the Queen will be presented through Lieut. de Frisch

Correspondence.

To the Editor.

ON THE WEST COAST OF AFRICA: BY AN EX-CEYLON PLANTER.

Essnassie, Gold Coast, West Africa, Nov. 23rd, 1890.

DEAR SIR,—Today being Sunday, I take the opportunity to write you these lines, as promised. We reached Elmina on Saturday, the 1st instant, after a voyage from London of 28 days. This long time is due to the number of small ports the steamers call at. This port is in about the same latitude as Galle, and in an old Dutch fort is stationed a Hawsa regiment with *one* European officer in command; he being the only white man in the place, and, of course, acting in all sorts of official capacities. Once a week a Mr. Holmes, District Commissioner, goes over there from Cape Coast and holds Court. They were both very kind to me, but this is just what one would expect if the wish of Government is to open up the country.

The natives are in many ways like our Ceylon friends, and those in towns just as cheeky. As labourers they are good out of their own country, but not in it—servants are very good and beat the Tamil appu hollow. The principal articles of export trade are rubber, priced here at 1s to 1s 3d, and palm oil and nuts. They are purchased or bartered for clothes, guns and other articles.

The temperature is about the same as in Kandy, and when at its worst like Colombo, but the evenings are much cooler.

We were detained about ten days at Elmina and then started for this place with our Kroo boys loaded up with tools and stores. I wanted to bring 200 of these labourers from their coast, but I only managed to bring 71 with me, the balance I gave 'books' for. This consists of a letter asking any captain or cruiser to bring a stated number of boys to a stated port and there obtain payment at 15s per head: this price is uniform from the Liberian coast as far as Ockra.

Now about the country: the growth all round beats that of Ceylon, the soil is generally a dark loam for a depth of from 1 to 2 feet, and then a subsoil, as in Dikoya, of a clayey nature. There is just enough slope to permit of good draining, and very little rock; the rainfall and the temperature are about the same as in Kadugannawa. The price of land is nominal, and Kroo labour is good and cheap, costing about the same as the Tamil. Pepper is found wild, and cacao and Liberian coffee grow well, I hear, but I have not seen them yet. Orobua coffee has not been tried, but I have no doubt it will succeed also; I intend to make an experiment. Roads are rather bad and in parts very swampy. I think that the prospects for planting are far more encouraging here than in Ceylon, for coffee and cacao, when they well grow, are far more remunerative and want less labour than tea, but of course, as is the case anywhere else, capital is wanted to make a start.

I have given away a lot of Ceylon tea, and all like it very much. It 's bosh about Ceylon tea, not keeping, I have some, the lead of which was broken in packing 5 or 6 months ago, and it is still in very good condition. There is not much chance of a trade springing up yet, but I hope to be able to introduce our tea all along the coast before long.—I am, dear sir, yours truly, S. W. GANE.

CEYLON TEA AT £5 10 PER POUND.

London, E. C., Jan. 23rd, 1891.

GENTLEMEN,—I send you a cutting of a leading article in the *Daily Telegraph* of Jan.17th on some wonderful quality of Ceylon tea which has excited special interest.

Messrs. Elliot, Lack & Porter inform me "that this lot of tea consisting of three 5 lb. boxes in all 15 lb, was knocked down at public sale for 87s per lb. and subsequently resold for £5 10 per lb to the United Tea Company of 21 Mincing Lane. The special fea'ure was its exceptionally good make and appearance, being almost entirely 'Golden Tips.' The liquor would naturally be fine but not at all commensurate with the *appearance* which was primarily the cause of the high price paid."

On receipt of the above information I went round to see this tea, which was publicly advertised to be on view at the Company's offices.—I met a whole crowd of Ceylon men there who all thought that the sample must have been the result of special picking and most careful manufacture, probably a little at a time and by hand. No doubt the final price was the result of competition in order to secure the sample for show purposes; still great credit must be due to the management which has secured 15 lb. of such wonderful tea, and *Gallebodde* estate has certainly made a name famous for good tea which the proprietors should be grateful for, while it should stimulate their neighbours to improve the quality of their tea by greater attention to the cultivation, picking and manufacture under scientific principles. JOHN HUGHES.

TEA PACKING: LEAD PAPER, SPECIAL PAPER:

London, E. C., Jan. 29th.

DEAR SIR,—I have read your editorial on "lead paper" contained in your issue of 8th inst. I hope the public will understand that this lead paper is entirely a different article to the paper I am introducing. I don't wish in any way to disparage the paper entitled "Clark's Patent," indeed it may be an excellent substitute for all I know, but I wish it to be clearly understood that my paper is quite apart from this, possessing no lead about it whatever. Since last writing you, I have received an application to supply a large group of estates in India with it. The proprietor, who is at present at home, inspected the packing of the Elkaduwa chests on their arrival and was so pleased with the satisfactory condition of the tea and the serious saving in cost that he is adopting the paper on his estates.

I think your idea as to forming a Sub-Committee of the Planters' Association to consider such improvements an excellent one, and I trust it will be acted upon. It is the only proper and practical way to bring the matter clearly before the community. Let such Committee be provided with samples of linings recommended as substitutes for the present lead, and having regard to cost, in conjunction with efficiency, report accordingly. In the meantime I am quite satisfied to utilize my own paper, for until anyone can produce a substitute equally efficacious in preserving the tea and showing a further saving in cost over the present of some 50 per cent. as compared with the ordinary lead lining, I don't look for anything better.—Yours faithfully, J. M. MAITLAND KIRWAN.

[We should be glad to know if the whole of the tea of any one estate is packed in this paper. —ED. *T. A.*]

LIBERIAN COFFEE: PRACTICAL HINTS.

SIR,—Being one of those who rushed into Liberian coffee, a dozen years ago—went out for wool and came back shorn but did so in very good company—I have naturally small confidence in a successful revival of its cultivation even with all the experience gathered in the past time: It would not have been so complete and general a failure over the lowcountry had we known then what we

know now of the character and requirements of the plant. I will certainly not tempt fortune a second time myself under any conditions; but as there are bolder spirits in the field, some of them may possibly profit by the formulating of my experience.

When the plant has had moisture enough to establish itself even in indifferent soil, it flourishes with high promise for the first two or three years unless attacked by hemileia, to which it is even more susceptible than the Arabian kind and succumbs more quickly. It is when it begins to bear that it begins to fail. It does not like the Arabian species respond to the use of the knife, and should neither be topped nor pruned but allowed to grow at its own free will. It can hardly be classed as a "forest tree," but in tolerably favourable situations it may be seen upwards of twenty feet in height. As to climate it probably needs somewhat greater heat than is necessary to the Arabian kind, but it should never be tried in the open in a climate subject to droughts of two or three months' duration, each spell of which leaves it weaker and more bare. The conditions of success in the lowcountry are a deep and tolerably rich soil under the shade of tall forest—the denser the better—that will not interfere with its upward growth. In such a situation the only cultivation required is to exterminate the undergrowth and bury from time to time the fallen leaves, in which case 2 cwt. per acre may be fairly hoped for. W. B. L.

[W. B. L. wrote before he saw about the Peradeniya experiment, but that was on a gardening scale, yielding R444 per acre worth of crop. —ED. *T. A.*]

INDIAN TEA EXPORTS.

Indian Tea Association, Calcutta, 10th Feb. 1891.

DEAR SIR,—The General Committee have the pleasure to hand you their usual Monthly Return of shipments of tea from Calcutta, and also a Return of Ceylon tea for four years up to the 19th January 1891:—

EXPORTS OF INDIAN TEA FROM CALCUTTA.

	1891 lb.	1890 lb.	1889 lb.
Export to Great Britain from 1st May to 31st January ...	92,956,313	89,129,802	86,826,585
Exports to Australia and New Zealand from 1st May to 31st Jan..	4,345,120	3,204,962	2,750,773
Exports to America from 1st May to 31st January ...	118,510	164,485	143,409
Exports to other places from 1st May to 31st January ...	971,512	1,329,970	757,722
Total Exports from 1st May to 31st January	98,391,485	93,829,219	90,478,189

—Yours faithfully, S. E. J. CLARKE, Secretary.

"JAMAICA SORREL."

Awisawella, Feb. 4th.

DEAR SIR,—In your paper of 24th ult. (see page 596) I notice a foot-note enquiring what "Jamaica sorrel" is. I believe it is the *Hibiscus sabdariffa* or what is commonly known as *Rozella*. It yields a very good jelly, and if the fruit is not too old a very fair jam. This plant begins to flower in December, the fruit ripening in January and February. Tamil coolies value this on account of its acid leaves, and apparently ignore the fruit. In common with all the Hibiscus family it yields a good fibre, and I have found the roasted seeds a very fair substitute for coffee. In a raw state they are good food for fowls, of a nutty and agreeable flavor. In a former *T. A.* I remember reading that this same plant is much valued in Queensland. The calyces of the fruit are gathered and dried and have a commercial value, besides being used for preserves. A wine is manufactured therefrom.—Yours,

PLANTER.

ROOFING FOR CEYLON: PRACTICAL HINTS; A TREADMILL FOR PRISONER.

Kinmylies, Travancore, 16th Feb. 1891.

SIR,—With reference to your article on Roofing for Ceylon I wish to say that I hear that many Missions and many Native Companies have been making the Mangalore tile all along this coast of India, and that the supply is very large at present.

It occurred to me when the experiments with mana-grass for making tea chests commenced, that if it were successful, a shingle, or tile, made of that or other Ceylon grown fibre, treated like the Willesden patent paper, ought to follow. I think you did once refer to paper-mâché *walls* for bungalows or factories as an idea for the future.

With regard to the question of keeping the Colombo lake full by pumping from the Kelaniganga, I would suggest a treadmill on which the Sinhalese felon might take enough exercise to give him an appetite for that plainer food we hear he now enjoys: but he should be exposed to the public gaze though out of the reach of tobacco and betel.—Yours etc., E. F. DAVIES.

WOODCOCK IN CEYLON.

Algooltenne, Elkaduwa, Feb. 23rd.

SIR,—It may interest some of your readers to know that I shot a woodcock in my jungle this morning. I saw one in the same spot in 1883. —Yours faithfully, A. M. HURST.

MONARAGALA: ITS NEWS AND ITS CROPS.

Koslanda, Feb. 23rd.

SIR,—As an example of "English as she is wrote" the reports of your Monaragala correspondent are admirable, and the persistency with which he urges the appointment of a J. P. is much to be commended.

Further, I entirely agree with him that the district will grow excellent tea, though the fact he mentioned the other day that plucking had been begun on some estates with an average of half a pound a cooly may not be in itself convincing proof of this.

But when he speaks of poor crops and makes sweeping if somewhat inappropriate reference to "Pharoah's lean kine" he should discriminate. There are crops and crops now-a-days, and one product, viz. cacao, is doing very well at Monaragala

A. B.

COCONUTS AND TEA.

DEAR SIR,—I see you have lately been noticing with favour the planting of tea and coconuts together on the same land, in which it appears to me you are somewhat on the wrong side of the line. As a principle nothing is ever gained by the attempts to make land do double duty by planting two or more species of crop, yielding perennial plants as permanent occupants by way

of having more than one string to the bow. If a given piece of land is believed to be unequal to the profitable growing of tea, for at least one generation refrain from planting it with that product. Those who plant tea and coconuts on the same land must have very little confidence in the former and only use it as a means of making something off the land while the main and permanent plant is coming on, but yielding nothing; and if the coconuts thrive, down goes the tea when it has just reached its prime and is yielding a larger profit than coconuts ever will. Tea is a plant that will not yield its product freely under shade; and at ten years old a thriving field of coconuts throws a dense shade over the whole surface if planted at the usual distance apart. Then as the stems run up the trees shed about 800 heavy leaves twenty feet long annually on every acre, and each one smashes five or six tea plants. This sort of thing is tea cultivation under difficulties, and the object of planting the tea, that of making some profit off the land while the coconuts give none, will be defeated; for the spread of the coconuts will ruin the tea before it arrives at its full yield, and that before its successful rival yields a nut. To those who would have both tea and coconuts on their land, I say, plant them apart on separate fields, and if you do not believe that tea alone will pay do not plant it. W. B. L.

[Yes: but suppose the coconuts were first planted, and being slow of coming on, tea is added a year or two after and from the third to the tenth year, gives net returns equal to from R40 to R80 per acre without injuring the palms? And then up to perhaps 15 years gives profitable though less returns. We have heard of at least one place that is likely to do this or something like it.—ED. *T. A.*]

CEYLON TEA IN RUSSIA.

St. Petersburg, 16/28 Jan. 1891.

DEAR MR. EDITOR,—Allow me to offer you my hearty thanks for the book and the copies of the *Ceylon Observer*, all of which I have safely received. I see by the report in the *Observer* that Mr. Rogivue is at last commencing to introduce the tea in Moscow and other places. In St. Petersburg none of my acquaintance, which is a pretty extensive one, have yet been able to purchase the tea. As Mr. Rogivuo cannot be in every place at one time, I should be very glad if he would establish a sub agent here, whom I would be very glad to assist so far as my present duties will permit.

The most suitable person for this post according to the writer's opinion is Mr. Richard Wylie, a well-known broker on the St. Petersburg Stock Exchange.

Mr. Wylie has resided in Petersburg over 20 years and is one of the most influential persons in the British Colony here. As Mr. W— is acquainted with almost every person of importance, he would be a capital agent not only for your tea, but for other colonial productions: coffee, cocoa, cinnamon, cinchona, &c., for which Petersburg is a great market.

Mr W— is the son of a Scotch clergyman and is a gentleman of unblemished reputation. His eldest son is tutor to Lord Rosebery's children. I recommend Mr. W— so strongly to your notice not only on account of his personal qualities, but also because he formerly resided in India and was engaged in the cultivation of cinchona on the Nilgherry Hills where he had 2 estates.

Mr. Rogivue has not yet called for the writer. My idea would be to establish two small shops in Petersburg and Moscow and from these establishments to take orders and sell tea wholesale and by retail. I would have also had a refreshment room adjoining the shop where the public could taste the tea before they purchased it at a moderate charge. These shops would have been small, but furnished and embellished with all the taste and richness the Sinhalese people are so famous for.

Tea could have been sold at this place and small samples distributed gratis until the public had overcome their oldfashioned prejudices. There would have been no risk in carrying out this plan, whereas I am not so confident that the one that has now been adopted is not somewhat too risky.

But it is not for the writer to criticize. I can only wish you and the planters every success, and that you will be able in the future, to seize a large portion of the Chinese tea trade and by means of commerce enterē into more close and friendly relations with the millions of this mighty Empire.—Yours sincerely,

WILLIAM BARNES STEVENI.

P.S.—If you could once get the Russian public to like your tea it would pay (in a commercial sense) to run a railway through Afghanistan and send all your tea to Russia direct by land via Persia or the Transcaspian Railway. India and Ceylon ought to beat China. They are much nearer.

WASTE PRODUCTS: SURPLUS TEA SEED SUBSTITUTES FOR FIREWOOD.

DEAR SIR,—It has often occurred to me that if we only looked about us we might easily find a profitable use for the hundreds of tons of really good tea seed (except for nurseries) which we cannot help growing but for which hitherto no one has suggested a use. I mean, of course, the seed which *will insist* on growing on our plucking bushes.

Some years ago, a planter of my acquaintance having gathered a large quantity of seed for which he could not find a purchaser endeavoured to turn it to account by converting it into oil. He obtained a common village oil-press, and having thoroughly dried the seed for several days in the sun, succeeded in pressing out about 10 per cent of oil which burnt with a clear bright flame in common oil lamps and which the coolies used greedily for their curries, etc. This particular lot of seed, however, having been carefully gathered and husked had cost a considerable sum, and being still valued at R10 per maund, the experiment was pronounced a failure; but with seed worth absolutely nothing and which would cost a mere trifle to gather and prepare, might not the result be very different? Besides I am of opinion that by fermenting the seeds (and perhaps a gentle roasting) the percentage of oil would be considerably increased.

Of course, the time to gather the seeds for this purpose would be when *pruning* a field, when the whole could be stripped off and thrown on a barbacue where it would remain till ready for the press, requiring no further attention except an occasional turning, as all the ripe seeds would fall out of the husks after a few days' exposure, and a few showers would not hurt the seed (for oil); hence as I said before the cost of gathering and preparing would be a mere trifle.

Then is it not natural to suppose that the oil-cake of this seed would prove to be the best possible manure for tea, and if so it would also be the cheapest to apply, as a lb. or so would probably be sufficient for each bush?

Having thus found a use for the ripe seeds, we should still have the husks and *unripe* seed of which large heaps would soon be collected. I believe this would make a capital fuel and would probably

burn with a steadier heat and give less trouble to the stoker than common firewood.

Apropos of the *burning* question, weeds and all other vegetable rubbish, if pressed into a tolerably firm brick *while green* and then dried, make a fairly good fuel, being similar to the cakes of cow-dung, the only fuel used by the natives over a large part of India, without the objectionable smell.

Mana grass, if cut green and treated in the same way, would, I believe, be equal to the *best firewood.*

A common wooden press, all of which could be made up on the estate (except the screw and worm), would answer this purpose.

Of course, all the above suggestions are more or less problematical, but I give them in the hope they may lead to some practical results by provoking a discussion and perhaps causing experiments to be made.—Yours truly, WASTE NOT, WANT NOT.

CINCHONA BARK CROP IN JAVA.—We have received from the Soekaboemi Agricultural Society their table of statistics of the cinchona bark crop in Java for 1890 and 1891. Of 114 private estates enumerated, the greater number furnished statistics of area, outturn, amount of quinine sulphate in bark, &c. The result of these statistics is to show that in 1890 the actual outturn of bark from private and Government gardens together was about 3,000,000 kilograms containing an average of 4 per cent of quinine sulphate, equal to 120 000 kilograms of quinine sulphate, or about half of the world's annual consumption; while the estimate for 1891 is 3½ million kilos of bark containing an average of 4 per cent of quinine sulphate, equal to 140,000 kilos of quinine sulphate, or nearly 4-7ths of the world's annual consumption.

TOMATOES.—As a result of experiments and observations carried on at the Agricultural Experiment Station, at Cornell University, Ithaca, New York, Messrs. Bailey and Munson conclude that:

1. The Tomato plant is quickly susceptible to careful selection.
2. As elsewhere in the vegetable kingdom, the character of the plant as a whole appears to have more hereditary influence than the character of the individual fruit.
3. Very heavy manuring does not lessen productiveness.
4. Neither nitrate of soda nor muriate of potash alone are profitable Tomato manures upon thin soil.
5. Very early setting of stocky plants in the field, even in dark and raw weather, augmented earliness and productiveness.
6. Seedlings gave far better results than cuttings.
7. Trimming the plants lightly late in summer gave a greatly increased yield.
8. A double or monstrous flower upon a young plant is no indication that succeeding flowers upon the same plant will be double, and produce irregular fruits. But varieties which habitually bear double flowers are also the ones which habitually bear irregular fruits.
9. Cool and dark weather in early fall, and early fall frosts, are the leading drawbacks to profitable Tomato culture in the North. To avoid these dangers as much as possible, plants must be started early and forced rapidly.
10. The essential general points in profitable Tomato culture are these:—Careful selection and breeding; early sowing; frequent, or at least, occasional transplanting to obtain stocky plants; rich soil, well prepared and well tilled.
11. There is evidence that varieties of Tomatos run out, even under good culture.
12. The best market Tomatos appear from our tests to be Ignotum, Favourite, Bay State, Atlantic, and perhaps Ruby among the red varieties; Beauty, Mikado, and possibly Potato Leaf, among the pink or purple varieties; Golden Queen among the yellow sorts.
13. Among the novelties, Ruby and Chemin Market are most promising.—*Gardeners' Chronicle.*

THE TRAVELLING AMERICAN'S FASHION OF MAKING TEA is as follows:—Little perforated silver balls are filled with the dry tea and, being suspended by a chain, are allowed to remain in the cups of boiling water as long as may be required. This mode of preparing tea obviates the risk that callers often run of drinking overdrawn tea.—*Madras Mail*, Feb. 19th. [The silver egg for making tea is a very old invention.—ED. C. O.]

THE JAVA COFFEE CROP.—According to a telegram from the Governor-General of Netherlands India, dated Jan. 31st last, the next Government coffee crop in Java is estimated at 359,648 piculs which is considerably more than in the preceding year; but further information must be waited for, as the first estimate in 1890 was also much higher, and afterwards great disappointment was occasioned. —*L. and C. Express*, Feb. 6th.

TO PREVENT SLIPPING OF BELTS.—Edwin A. Kimball, instructor in the shops at the University of Illinois, says on this subject:—"I do not know that washing soda may not be as good as castor oil, for I never used the former; but I do know that castor oil is effective and safe in the hands of a competent person. There is no occasion to soak a belt in any sort of oil. A little applied to the surface is sufficient. There is nothing that I have ever tried that is so effective as castor oil, especially for wood-working machinery belts. The way to apply it is to let it run from a bottle in a small stream on the belt while this is in motion, commencing at one edge of the belt, moving the stream over a little at every full travel of the belt, until the width of the belt has received its portion. I know of belts that have been treated in this way for years, and they are whole yet, and doing their work without a murmur.—*Engineering and Iron Trades Review.*

THE AMERICAN FARMERS' ALLIANCE.—Mr. Polk, the President of this body, formulates its demands as follows:—

A system of finance which recognizes and secures to every citizen of this country an equitable, fair and just right to share its benefits, and which will furnish a volume of circulating medium, adequate to the legitimate demands of the country, at a low rate of interest, is the greatest and most urgent need of the times. Let the people here represented continue to reiterate and with increased emphasis demand:

First, That silver shall be restored to its dignity and place as a money metal, with all the rights of coinage and all the qualities of legal tender which gold possesses.

Second, That the currency of the country shall be issued direct to the people at a low rate of interest and without discrimination, and shall be a legal tender for all debts, public and private.

Third, That taxation shall be more nearly equalized by requiring that all property shall bear a just proportion of its burthens.

Fourth, That alien ownership of land should be resisted and prohibited.

Fifth, That public transportation should be owned and controlled by the government.

Sixth, That no class nor interest should be taxed to build up any other class or interest.

Seventh, That public revenues should be limited to an honestly and economically administered government.

And for the further security of the public welfare let them demand:

Eighth, A just and equitable system of graduated taxation on incomes.

Ninth, The election of United States Senators by a direct vote of the people.

These demands are the necessary and legitimate outgrowth of our rapidly advancing civilization, and the highest considerations for the public weal and safety should impel us to earnest and persistent endeavour to engraft them upon our governmental policy.—*Florida Despatch.*

TEA AND COFFEE SUBSTITUTES.

So long ago as 1883, I contributed to the *Gardeners' Chronicle* a few notes under the head of "Tea and its Substitutes." These notes appeared on pp. 802—3 in the number of June 23, vol. xix., new series, and on pp. 765—6 in the number for December 15, vol. xx., new series. What was there stated as to the interest of the subject might be repeated here, notwithstanding that seven years have passed since those notes were written, during which time many more plants have come to my notice having similar uses in different parts of the world.

Many changes have taken place in the growth, cultivation, and trade of tea proper during the seven years that have elapsed, and other countries have entered the market as tea producers since that period, the demand for the dried leaves of Camellia theifera increasing with the supply. The return of Christmas, when an extra good cup of tea is often included amongst the items of good cheer, seems an appropriate time to return to this subject, not that we think any of those plants to be enumerated would commend themselves for actual use amongst the bulk of our readers, but a record of them will indicate how varied are the sources from whence a refreshing—or, in some cases it may be a medicinal—beverage is obtained.

Twenty-four distinct plants were described in the former notes, and they were arranged under their respective natural orders. The same arrangement is continued in the following notes, and the numbering taken up from thence.

BERBERIDEÆ. 25. *Caulophyllum thalictroides*, Michx. —A perennial herbaceous plant, with a tuberous root, and stems about 1 foot. It is found in mountainous shady woods in South Carolina, where it is known as Blue Cohosh. The plant also occurs in Japan and Mandschuria. The seeds, when roasted, are said to form an excellent substitute for coffee, for which purpose they are used by the natives in North America.

FRANKENIACEÆ. 26. *Frankenia* (*Beatsonia portulacifolia*, Roxb.).—This is one of the few indigenous plants in the Island of St. Helena, and the genus was named in honour of Beatson, who wrote an account of St. Helena. It is found on rocks by the sea on the south side of the island. The flowers and flower-stalks, when simply dried, are of a brownish colour, and are known as St. Helena tea. There is a sample of this tea in the Kew Museum which was gathered in 1868, and still possesses a strong aroma similar to Chinese tea.

GERANIACEÆ. 27. *Geranium incanum*, L.—A plant with trailing stems. Native of the Cape of Good Hope. In Natal the leaves are used as tea under the name of Natal Wild Tea. There is a sample in the Kew Museum, which was obtained from the Natal Court of the Colonial and Indian Exhibition of 1886, and it possesses a smell not very dissimilar to that of ordinary tea. There is a sample of this in the Kew Museum.

28. *Monsonia ovata*, Cav.—An herbaceous plant of the Cape of Good Hope, where it is known under the name of *Keita* by the Hottentots. The roots and herbs of the plant are very astringent, and are used at the Cape in dysentery; an infusion or tea is made from them, used among the Fingoes to promote abortion.

LEGUMINOSÆ. 29. *Sebania occidentalis*, Pas.—In the Kew collection is a sample of the long slender pods of the above-named plant, gathered on the banks of the River Magdalena, and labelled "Wild Coffee, Café de Brusca or Chiliuchile."

30. *Abrus precatorius*, L.—This well-known plant, which is found in nearly all tropical countries, and whose seeds are so generally known as crab's eyes, appears at one time to have had a reputation as a tea plant, for Lunan in his *Hortus Jamaicensis*, quoting from Beecham, says:—"I know a gentleman in Jamaica that made a tea of the leaves, and drank of it many years, which he said kept him in good health."

31. *Cassia mimosoides*, L.—This plant is referred to in a list of economic vegetable products exhibited in the Cape of Good Hope collection of the Colonial and Indian Exhibition, 1886, as being used at the Cape as a substitute for China tea, under the name of Bushman's or Hottentot tea.

32. *Acacia myrtifolia*, Wild.—A tall, glabrous shrub of New South Wales, Victoria, Tasmania, and South and West Australia. The leaves are said to be sometimes used as tea.

Amongst other leguminous plants, reference may be made to Psoralea grandulosa, which, however, was referred to in our notes in December, 1883. In addition to what is there stated, it may be said that in the Mauritius the plant has not only a medicinal reputation, but is also used as a substitute for Tea. It appears, further, to have been at one time an article of import to this country, judging from a note by Tweedie in the Kew Herbarium, where it is said that the plant was "good for disorders of the stomach," and that "large quantities were carried to England and sold as Radical Tea in the Radical Times."

Two other leguminous plants have recently been used in France in the composition of medicinal teas, under the names of "Thé des Alpes Maritimes," and "Thé Purgatif des Apennins." The first is a composition of broken leaves of a plant which cannot be identified, a few Senna leaves, and a free use of the flowers of Anthyllis vulneraria, and perhaps Colutea arborescens; the second contains a larger proportion of Senna leaves, flowers of Anthyllis vulneraria, and florets of Centaurea cyanus. Whether these flowers possess any direct properties in themselves, or are put in to improve the appearance of the so-called tea, or increase its bulk, is a question not easy to solve.

ROSACEÆ. 33. *Acœna sanguisorbæ*, Valet.—A native of Australia, and found in all the Colonies except Western Australia. Maiden, in his *Useful Native Plants of Ausatralia*, says:—"The leaves of this plant have been used as a substitute for tea, and have been highly spoken of by some for this purpose."

34. *Rosa canina*, L. (Dog-rose).—Of this wellknown plant, Sowerby says, in his *Useful Plants of Great Britain*, that the leaves have been used as a substitute for tea.

SAXIFRAGEÆ. 35. *Saxifraga crassifolia*.—Under the name of Mongolian tea, the leaves of this plant are said to be used by the people of Siberia.

MYRTACEÆ. 36. *Verticordia pennigera*, Endl.—Under the name of native Tea, the flowers and leaves of this plant were shown in the West Australian Court of the Colonial and Indian Exhibition in 1886, with a note to the effect that the taste not unlike that of ordinary tea, and that the settlers in the earlier days of the colony used it as a tonic and blood purifier. There is a sample of this in the Kew Museum, which has a faint smell of Chinese tea.

37. *Kunzia Mulleri*, Benth.—The dried leaves of this plant, which have a similar smell to the lastnamed, were likewise shown in the West Australian collection in 1886, where they were simply described as native Tea, possessing the same medicinal properties as the Verticordia.

MELASTOMACEÆ. 38. *Cremanium theezans*, D. C.—This genus is now placed by the authors of the *Genera Plantarum* under Miconia. It is a tree from 12 to 20 feet high, a native of damp places about Popayan, where the leaves are infused and drunk in place of tea by the inhabitants. Boupland says: "We have often drunk with pleasure the infusion of the Melastoma theezans. It has the colour of tea, and is much less astringent, but more aromatic; many persons would doubt less prefer the drink to tea, and I think it will be found as useful in most cases."

TURNERACEÆ. 39. *Triacis microphylla*, Griseb., which is now put into the genus Turnera, is said to be used in Hayti as a tea plant, under the name of Thé de Lasca hotas. A small sample of this tea is contained in the Kew Museum.—J. R. JACKSON, Kew. —*Gardeners' Chronicle*.

A SUBSTITUTE FOR QUININE has been found in the extract from the root of a shrub called *Pambutano*. According to the *Medical Press and ircular*, the aqueous decoction of this root has proved a remedy in cases of malarial fever where quinine failed. The active properties of the root are obtained by its maceration in alcohol at 60deg. Fahr. The alkaloid has not yet been isolated.—*Globe*.

THE DISCOVERY OF SPONGE BANKS of a considerble extent and of groat yield at Lampedusa. Trapani, Egadi and Pantelleria has come very opportunely and will no doubt exercise a beneficial influence upon the shipping and labouring classes of the coast. The quality of the article brought from Lampedusa is of the very best, and theee new supplies will no donbt influence prices all round and everywhere.—Naples, Italy Dec. 11.—*American Mail.*

SARAWAK TEA has been reported on as follows:—"A sample of tho Matang tea was handed to an English firm last month. They report upon it as follows:—'We carefully return your most interesting sample of Sarawak toa which we have this morning liquored and are delighted and surprised with it. The preparation and make of this tea are very much to be commended and the liquor we thiuk would have been most marketable had proper precaution been taken in sending one the samples in *soldered up tin*, for tho leaves seem to us at present to be in process of decay, we think if this tea had been sound, it should have fetched in Mincing Lane, about the same money as two parcels we recently bought, and of which we enclose samples, the Ceylon at 10d and the Indian at 9d.'"—*B. N. B. Herald.*

ENTOMOLOGICAL SOCIETY, Feb. 4th.—Mr. C. J. Gahan called attention to a small larva which he had exhibited at the meeting of the Society on the 1st of October last, when some doubt was expressed as to the order to which it belonged. He said that Prof. Riley had since expressed an opinion that the larva was that of a dipterous insect of the family Blepharoceridæ, and might probably be referred to *Hammatorrhina bella*, Löw, a species from Ceylon.—Mr. C. O. Waterhouse exhibited specimens of *Scyphophorus interstitialis*, a Mexican species, and *Aceraius comptoni*, a Ceylon species, recently taken by Mr. Bowring in his greenhouse. He also exhibited, on behalf of Miss E. Sharpe, a specimen of *Daphnis hypothous*, Cramer, a native of Borneo, Java, and Ceylon, caught some years ago at Crieff, N. B. The specimen had long been confused with *Chærocampa nerii*, under which name its capture was recorded in the *Entomologist*, xiii. p. 162 (1880).—*Athenæum*, Feb. 14th.

CACAO CULTIVATION IN PERU.—Up to a recent date the cultivation of cacao in Peru seems to have been confined more especially to the Transandine slope, in the province of Convencion, in the department of Cusco, not, however, in sufficient quantities to supply the markets of the southern departments of the Republic. The cacao produced is of a superior quality, and could compete advantageously with best descriptions raised at Soconusco and in Venezuela. The excellence of the bean is, however, rather due to the geological and topographical conditions of the valley of Santa Ana than to the efforts of the cultivators—the cacao goes by the generic name of Cusco cacao—but, owing to the cost of production, distance from the sea, and deficiency of transport, cannot compete in price with that imported from Ecuador, consequently the production and consumption does not extend beyond what is requisite for the local demand. Cacao of good quality has also always been raised in the province of Jaen, in the department of Cajamarca, and the cultivation of the plant extends towards the seaboard in the north of the department of Piura, but upon so limited a scale as scarcely to amount to more than an experiment. With a more extended development, cacao could easily be produced in sufficient quantities for the internal consumption of Peru, displacing export from abroad, and perhaps even competing in foreign markets; a future for the industry which appears more than probable when the contemplated irrigation scheme in the department of Piura shall have been carried into effect.—*Foreign Office Report*, Oct. 8.

A BIG AMERICAN PRODUCE COMPANY.—Messrs. S. V. White & Co, New York; Messrs. John H. Davis & Co., New York; Messrs. Connor & Co., New York, are authorized to offer for subscription one million dollars of preferred eight per cent. Cumulative Stock mentioned below. Thurber-Whyland Company. Organized under the Laws of the State of New Jersey.—*New York Press*, Jan. 16.

THE FINEST TEA, in Oriental estimation, is gathered from shrubs which have been kept shaded for three weeks, so that the leaves are partly etiolated or blanched. It is called "flat tea," because the leaves are not rolled they are merely steamed and are never touched by the hand but turned over by the aid of a bamboo stick. After steaming they are merely dried. There is nothing in this peocess to justify the high price demanded for the tea. A Japanese chemist, Y. Kozai, assistant in the Agricultural Chemical Laboratory, has analysed this tea and found that it contains 30 per cent more theine than tho tea made from leaves grown in the sun. The work done by the chemist appears to be reliable. He analysed the natural leaf and the same manufactured into black and green tea. The chief difference he found was in the quantity of taunin, which was large in the natural leaf and in the green tea, but very much smaller in the black tea. He maintains that there is nothing injurious in faced tea the Prussian blue being only 1,000th part of the weight but he is severe in his condemnation of the practice of mixing with the tea the leaves of other plants.—"Ceylon Advertiser."

CEYLON EXPORTS AND DISTRIBUTION 1891

COUNTRIES.	Coffee cwt. Plantation	Coffee cwt. N'tive	Coffee cwt. Total.	Cinchona. 1891 B'nch & Trunk lb.	Tea. 1891 lb.	Cocoa. cwt.	C'moms. lb.	Cinnamon. Bales lb.	Cinnamon. Chips lb.	Coconut Oil. 1891 cwt.	Coconut Oil. 1890 cwt.	Pl'bago. 1891 cwt.
To United Kingdom ...	14300	...	14300	972664	9258694	6852	26480	164258	4221	7240	...	22887
,, Marseilles	...	...	...	...	1676	39	...	21200	...	...	...	...
,, Barcelona	...	...	...	..	1700	...	...	36000	...	...	...	...
,, Genoa	...	...	...	...	100	...	...	28700	8400	...	394	...
,, Venice	...	...	...	...	...	...	...	...	...	...	...	...
,, Trieste	372	...	372	...	210	...	...	...	2250	951	...	...
,, Odessa	...	...	...	...	...	...	...	...	...	...	...	...
,, Hamburg	...	...	...	...	...	77	...	37100	...	1304	...	5066
,, Antwerp	18	...	18	26662	...	...	...	...	...	200	...	...
,, Bremen	...	...	...	...	1645	..	...	...	...	...	...	...
,, Havre	...	...	...	...	...	...	...	...	...	...	...	...
,, Rotterdam & Amsterdam	...	...	...	21438	...	...	...	...	...	...	...	...
,, Africa	...	...	...	...	2985	...	...	...	...	...	...	...
,, Mauritius and Eastward	11	...	11	...	15514	...	...	...	...	1025	329	...
,, India	260	637	897	...	14367	...	25888	10080	...	15053	7108	10
,, Australia & New Zealand	1096	301	1397	...	391251	...	40	1000	2240	603	6	...
,, America	...	...	...	141545	20159	791	...	12000	...	11013	...	37892
,, Stockholm	...	...	...	...	...	...	...	...	...	...	...	...
,, Constantinople ...	...	...	...	...	...	...	...	...	...	...	...	...
Total Exports from 1st Jan. to 2nd March 1891	16057	938	16995	1162309	9708301	7759	55108	310338	17111	37389		65855
Do 1890	33322	744	33966	1198231	6094278	4768	80479	255937	57748	7827		44147
Do 1889	20580	1680	22260	1945314	4045699	5396	70270	307217	36919	65126		78035
Do 1888	36316	1274	37590	1284206	2602197	4653	57247	160249	147958	51769		38973

MARKET RATES FOR OLD AND NEW PRODUCTS.

(From S. Figgis & Co.'s Fortnightly Price Current, London, January 29th, 1891.)

EAST INDIA. Bombay, Ceylon, Madras Coast and Zanzibar.	QUALITY.	QUOTATIONS.
ALOES, Socotrine	Good and fine dry ...	£4 a £7
Zanzibar & Hepatic	Common and good ...	40s a £5 5s
BARK, CINCHONA Crown	Renewed	3d a 1s
	Medium to fine Quill ...	4d a 9d
	Spoke shavings	2d a 4d
	Branch	1d a 3d
Red...	Renewed	2d a 1s
	Medium to good Quill...	4d a 6d
	Spoke shavings	2d a 3d
	Branch	1d a 2d
	Twig	1d a 1½d
BEES' WAX, E.I., White	Good to fine	£6 a £7
Yellow ...	,, ,, ...	95s a 115s
Mauritius & Madagascar...	Fair to good	95s a 112s 6d
CARDAMOMS—		
Allepee	Fair to fine clipped ...	1s a 2s 2d
Mangalore	Bold, bright, fair to fine..	1s 6d a 3s
Malabar	Good to fine plump, cliped	2s a 2s 6d
Ceylon. Malabar sort	Fair to good bold bleached	2s 6d a 3s
	,, ,, medium ,,	1s 6d a 2s
	,, ,, small	1s a 1s 6d
	Small to bold brown ...	1s a 1s 6d
Alleppee and Mysore sort	Fair to good bold ...	2s 6d a 3s 6d
	,, ,, medium ...	1s 6d a 1s 10d
	,, ,, small ...	1s a 1s 4d
Long wild Ceylon...	Middling to good ...	6d a 2s 2d
CASTOR OIL, 1sts	White	4¼d a 4½d
2nds	Fair and good pale ...	3⅝d a 3¾d
3rds	Brown and brownish ...	3¼d a 3½d
CHILLIES, Zanzibar ...	Fair to fine bright ...	42s a 45s
	Ord'y. and middling ..	37s a 40s
CINNAMON, 1sts	Ord'y. to fine pale quill...	7d a 1s 5d
2nds	,, ,, ,, ,, ...	6d a 1s 1d
3rds	,, ,, ,, ,, ...	5¾d a 1s 2d
4ths	Woody and hard	5d a 10d
Chips	Fair to fine plant ...	2d a 6½d
CLOVES, Zanzibar and Pemba.	Fair to fine bright ...	3⅞d
	Common dull and mixed	3d a 3½d
,, STEMS	Common to good ...	⅞d a 1d
COCULUS INDICUS ...	Fair sifted	12s a 13s
COLOMBO ROOT... ...	Good to fine bright sound	20s a 27s 6d
	Ordinary & midling ...	16s a 20s
CROTON SEEDS, sifted...	Fair to fine fresh ...	10s a 15s
CUTCH	Fair to fine dry ...	24s a 32s 6d
DRAGONS BLOOD, Zanzibar ...	Ordinary to good drop ...	50s a 90s
GALLS, Bussorah & Turkey ...	Fair to find dark blue ...	52s 6d a 57s 6d
	Good white and green ...	40s a 50s
GINGER, Cochin, Cut ...	Good to fine bold ...	75s a 80s
,, ,,	Small and medium ...	40s a 52s 6d
Rough...	Fair to fine bold ...	35s a 46s
,,	Small and medium ...	26s a 32s 6d
Bengal, Rough	Fair to good ...	18s
GUM AMMONIACUM ...	Blocky to fine clean ...	20s a 50s
ANIMI, washed ...	Picked fine pale in sorts,	£12 a £14
	Part yellow & mixed do.	£10 a £12
	Bean & Pea size ditto ...	£5 a £7 10s
	Amber and red bold ...	£10 a £12
scraped...	Medium & bold sorts ...	£6 10s a £11
ARABIC E.I. & Aden ..	Good to fine pale frosted sifted	60s a 80s
	Sorts, dull red to fair ...	35s a 55s
Ghatti ...	Good to fine pale selected	45s a 55s
	Sorts middling to good...	23s a 33s
Amrad cha.	Good and fine pale ...	60s a 100s
	Reddish to pale brown ...	25s a 50s
Madras ...	Dark to fine pale ...	15s a 55s
ASSAFŒTIDA	Fair to fine pinky block and drop	26s a 38s
	Ordinary stony to midling	16s a 25s
KINO	Fair to fine bright ...	35s a 37s 6d
MYRRH, picked	Fair to fine pale ...	£6 a £8
Aden sorts	Middling to good ...	70s a 85s
OLIBANUM, drop...	Fair to fine white ...	30s a 45s
	Reddish to middling ...	22s 6d a 30s
,,	Middling to good pale ...	12s a 20s
pickings..	Slightly foul to fine ...	10s a 15s
siftings ..	Red hard clean ball ...	2s 2d a 2s 5d
INDIARUBBER	White softish ditto ...	1s 5d a 2s 1d
East African Ports, Zanzibar and Mozambique Coast	Unripe root	1s 3d a 1s 10d
	Liver	1s 3d a 2s
	Sausage, fair to fine ...	1s 10d a 2s 1d
Assam,	Good to fine ...	1s 8d a 2s 3d
	Common foul & middling	9d a 1s 6d
Rangoon	Fair to good clean ...	1s 10d a 2s 2d
Madagascar, Tamatave, Majunga and Nossibe	Good to fine pinky & white	2s 2d a 2s 7d
	Fair to good black ...	1s ½d a 2s 1d
ISINGLASS or FISH MAWS Tonguo.	good to fine pale ...	2s 9d a 3s 8d
	dark to fair ...	1s a 2s 6d
Bladder Pipe...	Clean thin to fine bold...	1s 6d a 3s 6d
Purso ...	Dark mixed to fine pale	6½d a 1s 8d
Kurrachee Leaf ...	Common to good pale ...	1s 9d a 3s 10d

EAST INDIA *Continued* East Coast Africa, Malabar and Madras Coast, Bengal.	QUALITY.	QUOTATIONS.
INDIGO, Bengal ...	Middling to fine violet...	4s 6d a 5s 7d
	Ordinary to middling ...	3s a 4s 3d
Kurpah	Fair to good reddish violt	2s 8d a 3s 5d
	Ordinary and middling...	2s a 2s 6d
Madras (Dry Leaf).	Middling to good ...	2s 6d a 3s 1d
	Low to ordinary ...	1s 6d a 2s 3d
IVORY—Elephants Teeth—		
60 lb & upwards ...	Soft slightly def. to sound	£70 a £76
over 30 & under 60 lb.	,, ,,	£64 a £71 10s
40 a 100 lb. ...	Hard ,, ,,	£50 a £58
Scrivelloes	Soft ,, ,,	£30 10s a £48
,, ...	Hard ,, ,,	£25 a £33 10s
Billiard Ball Pieces 2¼ a 3¼ in	Sound	£75 10s a £83 10s
Bagatelle Points ...	Sli. def. to fine sound ...	£66 a £75
Cut Points for Balls	Shaky to fine solid sd...	£54 10s a £73
Mixed Points & Tips...	Defective, part hard ...	£35 a £53 10s
Cut Hollows ...	Thin to thick sli, def to sound	£30 10s a £37
Sea Horse Teeth— ⅜ a 4½ lb.	Crvd. crkd & close strght	1s 1d a 4s 4d
MYRABOLANES, Bombay	Bhimlies I, good & fine pale	11s 6d a 13s
	,, II, fair pickings	7s 3d a 8s 3d
	Jubblepore I, good & fine	11s a 12d
	,, II, fair rejections ...	7s 6d a 8s 3d
	Vingorlas, good and fine	9s a 10s 6d
Madras, Upper Godavery	Good to fine picked ...	10s 3d a 11s
,, ,, ...	Common to middling ...	7s 6d a 9s 3d
Coast	Fair	8s 9d a 9s 3d
Pickings ...	Burnt and defective ...	4s 9d a 6s 3d
MACE, Bombay ...	Dark to good bold pale...	2s a 3s 2d
	W'd com. dark to fine bold	3d a 1s 2d
NUTMEGS, ,, ...	64's a 80's	2s 10d a 3s 3d
	83's a 180's	1s 6d a 2s 9d
NUX VOMICA Cochin, Madras and Bombay	Fair to fine bold fresh	10s a 12s 6d
	Small ordinary and fair	6s a 8s 6d
OIL, CINNAMON ...	Fair to fine heavy ...	1s a 2s 6d
CITRONELLE ...	Bright & good flavour..	¾d
LEMONGRASS ...	,, ,, ,, ...	1½d a 1¾d
ORCHELLA WEED Ceylon ...	Mid. to fine, not woody	20s a 25s
Zanzibar ...	Picked clean flat leaf ...	10s a 20s
Mozambique	,, wiry	25s a 35s
PEPPER—		
Malabar, Black sifted ...	Fair to bold heavy...	4 3-16d a 4¾d
Alleppee & Tellicherry	,, good ,, ...	
Tellicherry, White ...	,, ,, ,, ...	1s a 1s 1d
PLUMBAGO, Lump ...	Fair to fine bright bold	15s a 21s
	Middling to good small...	11s a 14s
Chips ...	Sli'tly foul to fine bright	9s a 12s
Dust ...	Ordinary to fine bright...	4s 6d a 7s 6d
RED WOOD	Fair and fine bold ...	£3 a £3 10s
SAFFLOWRE, Bengal	Good to fine pinky ...	55s a 70s
	Ordinary to fair ...	28s a 50s
	Inferior and pickings ...	15s a 25s
SALTPETRE, Bengal ...	Ordinary to good ...	16s 6d a 17s
SANDAL WOOD, Logs...	Fair to fine flavour ...	£35 a £60
,, ,, Chips..	Inferior to fine ...	£9 a £30
SAPAN WOOD	Lean to good bold ...	£4 a £7
SEEDLAC	Ordinary to fine bright	23s a 82s
SENNA, Tinnevelly ...	Good to fine bold green...	6d a 8d
	Medium to bold green...	4d a 6d
	Small and medium green	2d a 3d
	Common dark and small	1d a 1½d
Bombay ...	Ordinary to good ...	1d a 2½d
SHELLS, M.-o'-P. ...	EGYPTIAN—med. to large	85s a 97s
	small and medium.	90s a 100s
	oyster and chicken	90s a 100s
large	BOMBAY—fine thick ...	95s a 105s
medium and large	bright fairly clean	92s 6d a 107s 6d
small and medium	,, ,, ,,	90s a 105s
chicken ...	,, ,, ,,	85s a 100s
oyster and thin ..	,, ,, ,,	82s 6d a 100s
Mussel	ordinary to fine bold	28s a 60s
Lingah	Sorts... ...	3s a 10s
TAMARINDS	Mid. to fine blk not stony	10s a 12s 6d
	Stony and inferior ...	4s a 6s
TORTOISESHELL ...	Fair & fine clean heavy	19s a 30s
Zanzibar and Bombay	Low thin to mid. clean	7s a 18s 6d
TURMERIC, Bengal ...	Leanish to fine plump finger	14s a 15s
Madras ...	Fin. fair to fine bold brgt	16s a 18s
,, ...	Mixed middling... ...	15s a 16s
,, ...	Bulbs	10s a 12s
Cochin ...	Finger	11s a 12s
VANILLOES,		
Bourbon, 1sts ...	Fine, cryst'ed 5 to 9 in.	14s a 20s
Mauritius, 2nds...	Foxy & reddish 5 to 8 in.	10s a 15s
Seychelles, 3rds...	Lean & dry to mid. under 6 in. ...	7s a 10s
Madagascar, 4ths...	Low, foxy, inferior and pickings... ...	3s 5s

THE MAGAZINE

OF

THE SCHOOL OF AGRICULTURE,

COLOMBO.

Added as a Supplement monthly to the "TROPICAL AGRICULTURIST."

The following pages include the contents of the *Magazine of the School of Agriculture* for March :—

WATER IN SOILS.

WATER exists in soils (1) in chemical combination as ferric and aluminum hydrates, and hydrated silicates, and (2) in mechanical suspension as hydrostatic, capillary, and hygroscopic water. Water in the first condition is found generally at the bottom of soils, and being quite free to obey the law of gravity, it sinks down and is found in the drainage.

Taking up the subject of water in mechanical suspension: permanent hydrostatic water or "bottom water" is that reached when soil is excavated, as in the construction of wells : it is the source of capillary water. Where hydrostatic water exists at a shallow depth, the soil is not of the most profitable nature, unless it be first brought under a thorough system of drainage. Capillary water is held in the pores of the soil by capillary attraction, and is then not free to obey the law of gravity. Its source as before stated is hydrostatic water. Capillary water is of the highest value in keeping soils in a condition of healthy moisture, and its presence can be readily detected in soils.

Hydroscopic water in ordinary circumstances cannot be perceived. Its presence is detected by heating air—dried soil to 100° and holding a cold surface over it to condense the moisture. The loss in weight suffered by the soil through this operation indicates the amount of hygroscopic water it contained. The amount varies considerably in different soils : it usually increases in any one soil during night, and decreases during day. The hygroscopic property of soils or the power of absorbing water vapour from the atmosphere depends on the chemical and mechanical condition of the soils, as well as on the temperature of the air. Organic substances are more hydroscopic than mineral substances ; for instance wool will vary 10 per cent of its weight on different days, and that there would be an advantage in selling silk and woollen goods by weight. The power of soil in absorbing water vapour is generally in the same ratio as that in which it absorbs other gases, such as ammonia. In respect of hydroscopicity soils vary much. Silicious soil may be practicably said not to possess the property at all, calcareous sand shows it in a very slight degree increasing about 3 per cent of its weight, while a good loamy soil absorbs on an average 3·5 per cent, clay 5 per cent, and humus 12 per cent. The green manuring of sandy soils increases their hygroscopic power, and in fact the addition of any organic matter to silicious soils brings about this desirable result. The dryness or humidity of the air affects the rapidity with which soils will absorb water, while the temperature regulates the amount of water absorbed. During the day, when the temperature is high, moisture is lost, and gathered at night.

The capacity of retaining moisture that has been absorbed is also greatest with humus and least with sand. According to Schlœsing's experiments as given by Warrington, fine sand saturated with water and thoroughly drained, retained 7 per cent, a clay soil 35 per cent, a forest soil 42 per cent. Additions of organic matter will thus increase the retentive as well as the absorptive power of soils.

Capillarity depends on the porosity of the soil. In sandy soils the pores are large and the hydrostatic water is little drawn up. In a clay of medium texture capillary action is at a maximum, but if the clay be too 'heavy,' the water cannot ascend. The order for capillarity is as follows :—ordinary clay, humus, garden soil, sandy soil. In sandy soils though there is little capillarity, the water is drawn

up fast but not to any height. Evaporation is greater in a soil when it is occupied by a crop than when bare, and the faster the growth the more evaporation will there be. This will be better understood when it is borne in mind that plant food is taken into the growing plant in a state of solution, and that it is the evaporation of the water in the higher parts of the plant and the consequent concentration or thickening of the crude sap that causes the less dense solution of water and mineral matter to pass upwards, by the law of diffusion. In bare land capillarity and therefore evaporation is favoured by a tolerably dense condition of the soil. The operation of ploughing or otherwise breaking-up this soil tends to diminish the amount of evaporation by disturbing the conditions favourable to capillarity; evaporation is also diminished by the presence of stones on the surface of a soil.

OCCASIONAL NOTES.

A meeting, at which was present Mr. Schwann, M. P. for North Manchester, was held at the United Service Library on Thursday the 5th Feb., with a view to considering the subject of Technical Education for Ceylon. Speeches were delivered by Mr. Schwann, the Assistant Colonial Secretary, and others. We had not the pleasure of listening to these speeches, not having had the honor of an invitation to be present on the occasion. We found on enquiry from one of the promoters of the meeting that it was to be of the nature of a "private conference," though it subsequently turned out to be a very public affair, there being present newspaper reporters and a number of students and others. The gentleman referred to was good enough to express a wish to see us at the meeting, but we did not feel justified in being present under the circumstances. It struck us as rather peculiar, to say the least of it, that it should not have been thought proper by the conveners of the "private conference" to invite us, as solely representing technical education in this city. In one way it was fortunate that we were not of the large assembly that met at the Fort Library on the 5th, as we were thus enabled to dispassionately review the speeches delivered on the occasion through the columns of the press, unaffected by the enthusiasm that prevailed at a meeting patronised by an M. P. and a Manchester man to boot.

It is undoubtedly a great matter to hear a man of Mr. Schwann's experience of technical education, deliver himself on his pet subject: but it was a pity that those who should have seconded the efforts of the speaker by helping him to apply the general principles of technical education which he enunciated, to the special case of Ceylon, should have in their enthusiasm forgotten their part. The late Director of Public Instruction, however, as an old educational hand, spoke warily, while Mr. Ferguson's practical letter which was sent to the meeting, was very opportune. A meeting such as this, as giving a fillip to the public of Colombo, cannot but have a good effect; but it is to be hoped that the committee of the Association, which sprung into existence at the meeting, will keep the fire of their zeal burning till they attain the object of their existence as such.

The urgent necessity there is for constructing and repairing small village tanks has been much dwelt on of late. There are cases within our knowledge of cultivation being entirely at a standstill in places where it existed to a satisfactory extent, owing to the tanks in the neighbourhood supplying no appreciable quantity of water in dry seasons, if any at all. In some of these places it is practically beyond the power of the cultivator to get water from wells owing to the abnormal depth to which he must excavate before he can tap a water-bearing stratum. It is, however to be hoped, from the warmth with which the subject of irrigation is being thrashed out, and from the import of the visit of the Director of Public Works to India, that science will before long come to the aid of the inhabitants of these parts where nature is so hard a mistress.

Common ginger *(Zingiber officinale)* says the Kew Bulletin, as is the case with so many cultivated plants, is unknown in the wild state, but there is little doubt that it is a native of Asia. It was known as a spice to the Greeks and Romans, who received it by way of the Red Sea, and supposed it to be a production of Southern Arabia. It was very early introduced into the West Indies, from which it was shipped for commercial purposes to Europe as early as the 16th century. The dried ginger met with in British commerce is almost entirely derived from the West Indies, Sierra Leone, Egypt and India. It is noteworthy that none is sent to the British Isles from China.

The Kew Bulletin contains a note on Chinese ginger which is exported so largely, preserved in honey. For a long time there has been great doubt as to the plant which produced the large flat finger-like masses which were unlike anything produced by *Zingiber officinale*, the deterent cause in deciding this point being the difficulty in getting the plant to flower. It has been stated never to flower in China. Dr. Trimen, who received some roots from Kew, succeeded in growing the plant, but could not induce it to put out an inflorescence; and the same was the result at Kew. Now we hear from two quarters, viz., from Dominica and Hongkong, the Chinese ginger plant has flowered, which turns out to be *Alpina Galanga*, the greater galangal, a plant originally a native of Java and Sumatra and now much cultivated in India for its rhizomes.

The stem eelworm (*Tylenchus devastatrix*) is a minute, transparent, white threadworm, at its full growth scarcely more than $\frac{1}{25}$ of an inch in length, and its greatest breadth may be said in a general way to be $\frac{1}{40}$ of its length. Miss Ormerod recommends that, when a crop is affected by the eelworm, dressings of sulphate of potash, or mixtures of sulphate of potash and sulphate of ammonia, will be found successful in stopping attack, if applied as soon as the first

beginnings of deformed and stunted growth are observable.

At the late Tasmanian Agricultural Conference, Mr. E. H. Thompson, in reading his paper on Entomology, drew attention to the valuable properties of the *Pyretheum* as an insect destroyer. "This plant," he said, "which forms the basis of all insect powders is easily grown, and is harmless to plant life. The Washington department of Agriculture report that they have found it most effective in destroying insect life, even the most impenetrable scale insects. Every farmer and orchardist should have his patch of pyretheum, whether *pyretheum carneum, roseum,* or *purpureum.* The flower heads, the upper shoots and leaves, should be carefully cut and harvested, and then an infusion made by pouring boiling water on them, just in fact as tea is made. . . . . One ounce of the dried herb should make about 3 gallons of the infusion."

INDIGENOUS FOOD PRODUCTS: CULTIVATED AND WILD.

By W. A. De Silva.

Rubiaceae.

47. ***Hedyotis Nitida,*** W. & A. Sin. Pitasudupala.

Is a herb growing in both cultivated and uncultivated places. In cultivated places the plants grow luxuriantly and thrive well in fertile spots. The stem is much divided, soft and round, having a pale green colour with pink marks at the nodes. The leaves are ovate and are fleshy. The upper surfaces being pale green, whilst the under surfaces are of an ashy white colour, whence the Sinhalese name Pitasudupala. The flowers which are small and of a pink colour, are borne in clusters. The very small fruits are angular with a mottled appearance, and a slight sticky secretion on the surface.

The leaves of this plant are used as a food: it is eaten along with rice both boiled and in the form of a curry. The whole plant is believed to possess certain well-marked medicinal properties, and is specially valued as a blood purifier. It is also used in nervous diseases and in intermittent fever.

48. ***Mussænda Frondosa.*** L. Sin. Mussenda.

Grows in the uncultivated places in the warmer parts of the Island. It is a shrub generally from six to eight feet in height. The leaves are green with prominent nerves, branching from the midrib, placed almost equidistant from each other. This gives to the leaves a sort of freckled appearance. The peculiar characteristic of the plant is the white-coloured bracts. These bracts resemble leaves, but are a little larger in size and are of a pure white colour: they occur along with the flowers. The flowers of this plant are of a purple red colour and are very small. The fruits are of the size of ordinary myrtle berries, but of an oval shape; they are jet black when ripe.

The part used as food in this plant is the white-coloured leaves or the bracts. These are fried in oil and eaten along with rice. The young leaves are also used for dry curries. The leaves are used medicinally as local applications to allay swellings.

NOTES FROM A TRAVELLER'S DIARY.

After the failure of Coffee a great many of the natives of Kotmale have taken up the cultivation of Cardamoms in right earnest, and many have got large profits by this industry. The aspect of the district, its climate and rainfall, favour the growth of the plant, and some of the gardens that I visited are a sight worth seeing.

It takes about 3 years for the plant to bear, and the expenses of putting an acre under cultivation, and also for weeding the land during a period of 3 years, will come to about R80, according to an estimate given to me by a proprietor of some large cardamom plantations in Kotmale. About R160 worth of cardamoms could be gathered from an acre for a year, and the plantation will continue to give a high crop for over a period of ten years.

Two distinct varieties are cultivated, viz., Mysore and Malabar. On the Mysore variety the flower stalks or panicles given off from the root of the plant stand erect, while in the case of the Malabar variety they creep along the ground. The Mysore variety is far superior to the Malabar; its fruits are bigger and they fetch a higher price. The natives, however, prefer the Malabar variety, because it gives a better yield. I saw a few plants of another variety which give off flower stalks both from the top of the stem and the root.

Kotmale is as noted for its cardamoms as Dumbara is for its cocoa. In both districts the cultivation of these plants form the principal industry of the natives.

The cultivation of arecanuts ought to receive better attention from the native community of the hill districts. These districts, as a rule, are unsuitable for coconut cultivation. Arecanuts thrive and bear well on the hill sides, and therefore the Kandyans ought, I think, to pay the same attention to the cultivation of this plant as the lowcountry natives pay to the cultivation of coconut. It takes about 8 years for the arecanut tree to come into full bearing, and each tree will give an income, on an average, of about 50 cents a year from the time it begins to bear.

One great evil in native gardening is want of method. It is sickening to see a garden planted with all sorts of trees but without any order or regard to the growing and feeding space that should be allowed to each tree. There is much to be taught to the goiyas even in the elements of Practical Agriculture. We look to the School of Agriculture for the required improvement in this direction. Agricultural Instructors ought to be sent about the country. They could learn much themselves while imparting useful knowledge, and do an immense deal of good to the country by introducing useful products from one district to an other, and showing the people how to grow them.

I wish all Village Schoolmasters were trained agriculturists. We would have had them as such if, as the founder of the School of Agriculture

intended, we had the Normal School also in connection with this useful Institution.

I find that the late Director of Public Instruction has expressed his regret at the closing of the Normal School in several of his reports. Is it too late now to have a class for training teachers also at the School of Agriculture? Now that there is to be a Technical School, it would be advisable to have a class for training teachers in Agriculture and Technology.

There is little hope of teaching Scientific Agriculture to the old goiyas. We must begin with school boys. Every schoolmaster ought to have an experimental garden in connection with his school. If he is a trained agriculturist, he will know what to grow and how to grow. A taste for gardening and a desire for competition could be created in the minds of the boys by holding annual exhibitions and awarding prizes. For all these we ought to have teachers of the right stamp. They could only be got by proper training.

THE CULTIVATION OF GINGER.

(Zingiber Officinale.)

BY W. A. DE SILVA.

The ginger plant thrives in warm and temperate climates. It is herbaceous in its nature, but the plant is not an annual, though it is treated as such in cultivation.

The ginger plant was known from times far remote, and ginger was an article of import among the Greeks and Romans. It is supposed by some that the original home of ginger is the country bordering the Red Sea, as it was from the Red Sea ports that the spice was exported. But on the other hand there is every reason to believe as evidenced by historical records, that India was the original home of the plant. The generic name Zingiber is derived from the Sanscrit. At the present day the ginger plant is cultivated to a large extent in India, Cochin, Africa, and Jamaica.

The plant is said to attain to the height of from three to four feet, but in Ceylon we do not see it grow to more than half that height.

The cultivation of ginger is carried on in the villages of Ceylon to a small extent as a garden crop. The villages in the vicinity of Cotta produces a large quantity of ginger rhizomes.

As this plant thrives well only on very good soils and produces well under good treatment, the cultivation is confined to small patches on which the cultivators can bestow the care and attention the plants require for their successful growth. However, it is a very paying crop, and on that account the extension of its cultivation is very desirable.

In cultivating ginger in Ceylon, the land is well tilled and covered with leaf refuse which is afterwards burnt. After the process of burning, all pieces of unburnt twigs and bits of root are carefully removed, and the ashes are well mixed with the soil. Then beds are made 3 feet in breadth, and sometimes double that size, from 12 to 24 feet in length as the case may be. After these beds are carefully levelled, the sets of ginger are planted at distances of nine by twelve inches. The sets are selected from thin rhizomes which are cut into small pieces, leaving one or more buds which spring up a few days after they are planted.

The planting done, the beds are covered with old straw or leaf refuse; the former is preferred, as it could be evenly spread without much difficulty. This process is of great aid to the growing ginger, as by it a check is given to the growth of weeds which, if permitted to establish themselves at this stage of cultivation, are sufficient to spoil the whole crop. Besides, it helps to retain a certain amount of moisture by preventing excessive evaporation in dry weather, and in due time when the plants are most in need of manure, the straw or leaf refuse supplies this want after a process of decay.

Ginger is generally planted by the end of March and April, and the crop is obtained in ten to eleven months. The soil is then dug up and the rhizomes, commonly called roots, are gathered.

A large quantity of ginger sets is necessary for planting purposes, an acre of land requiring from six to ten hundredweights. The results are generally very encouraging, as the yield is from ten to twelve fold yielding eighty to hundred cwts. per acre. Ginger is seldom, if ever, dried by the cultivators of Ceylon. The produce being so limited, it is all consumed in a raw state. The price of a pound of ginger varies from two to eight cents according to the supply in the market.

Ginger is used in all countries as a condiment and a medicine possessing carminative properties. Indian and Sinhalese medical works abound in the uses and the praises of this medicine, and it is known as *Maha-Awushadha,* or the great medicine.

As a commercial product it is known in a dried state; and in chemists' shops is sold in the form of a powder,—the dried root being known as race (*rais*) ginger. There are two kinds of dried ginger, one of a brownish colour and the other white; the white ginger is produced by bleaching the rhizomes in chloride of lime.

The cultivation of this product in an extensive scale would no doubt prove to be a profitable one in some parts of the Island where the soil is rich and the rainfall favourable. It may perhaps be also cultivated with success under irrigation, and its cultivation is to be recommended in the neglected soils of the tank districts.

The curing of ginger for market purposes is very little understood here. When merely boiled and dried in the sun, the rhizomes shrivel up, and turn black. The following process is said to yield very good marketable ginger, and is the process adopted in Cochin and other countries where a large export trade exists.

"The rhizomes of ginger when dug out are thoroughly well scrubbed in water with a hard brush until every particle of earth is removed and then steeped for a night in a pretty strong solution of limewater (one ounce of unslacked lime to the gallon), then well rinsed in clean water and dried slowly."

BUILDING MATERIALS.

SECTION II. TIMBER.

BY A FACTORY APPRENTICE.

There are nearly 90 timber trees in Ceylon, but the following are the chief and the most

extensively used, and with which almost every Ceylonese architect and carpenter is well acquainted.

Halmilila is extensively used for carts, waggons, house buildings, tubs and casks. This wood is the best for oil casks in the island. On account of its fine grains it is chiefly used for works which have to bear great strains: its durability is from 10 to 80 years.

Palu.—The colour of this timber is a dark red, it is largely used for bridges and buildings, and it can also be safely used for underground purposes. It is the second heaviest wood (Na being the first) in the island: its durability is from 10 to 70 years.

Buruta.—The colour of this timber is a yellowish white, it is extensively used for bridges, waggon wheels, bullock carts, oil presses, buildings and furniture: it durability is from 10 to 80 years.

Na, known as iron wood, resembles Palu in colour, it is the heaviest wood (from whence the name iron wood) in the island. Its durability is from 10 to 60 years; it can be used for bridges and buildings, and oil can be obtained from the nut.

Suriya is a timber admirable for carriages, hackeries and gunstocks, but is not so durable as halmililla.

Ramanidella is a timber used for common house buildings. Very durable fences can be made from sticks.

Teak.—There are three different kinds of teak: *Ceylon teak, Cochin teak,* and *Moulmein teak.* The first-named is extensively used for bridges and buildings, the second and third for waggons, carts and arrack casks; it is used for arrack casks because the wood imparts a fine colour and flavour to the arrack.

Coconut is an excellent timber for fancy boxes and furniture.

Mal Buruta.—Next to Calamander this wood is the most valuable; it is excellent for furniture.

Kalumediriya (Calamander) is a scarce and beautiful wood, the most valuable for ornamental purposes in the island.

Kaluwara.—A very valuable wood largely used for furniture.

The following woods are used for underground purposes:—*Galmendora, Beriya, Buruta, Kaha Mililla, Keta Kala, Mi, Mian Mililla, Muruta, Palu.*

NOTES FROM INDIA.

(Being translated extracts from letters by a Sinhalese gentleman.)

The cultivation of the "King" orange is carried on to a large extent in India. These oranges are of excellent quality, and are of the size of an average husked coconut—the price of each fruit being about 3 cents. King-orange is cultivated most commonly in the hill district, and there is no reason why it should not grow well in Ceylon and become a favourite fruit, proving at the same time more paying than our "Sweet-limes."

Gram (cicer) is extensively grown in many parts of India. If it can be successfully grown in Ceylon, it would be better that the amount required for home consumption should be produced in Ceylon than that large sums of money should leave the Island to pay for the exported article.

Large quantities of pomogranate, which is largely produced in Persia, are brought over to India. These pomogranates have a splendid flavour, and are superior to anything we have in Ceylon.

[We have to thank Mr. Hemachandra Jayakody, of Galahityawa Vernacular Boys' School—the writer of the above notes—for a packet of king orange seeds, some of which have been put down at the School of Agriculture, the rest having been distributed. Mr. Jayakody, we understand, is visiting India to study Sanscrit literature. We hope he will continue to jot down any point of interest to us in his travels, and let us have the benefit of them.—Ed.]

THE GRAPE VINE.

(Vitis Vinifera.)

1. Botany and General Description.—This is a trailing deciduous hardy shrub belonging to the natural order *Ampelideae,* and climbs by means of tendrils. The leaves are alternate, deeply serrated, commonly divided into three and sometimes five lobes, and have long foot stalks. The flowers, arranged in lateral clusters in the form of a raceme, are of a greenish white colour and have a fragrant odour. The calyx is cut into five segments, and the petals, which are whitish and five in number, soon drop. The fruit is a one-celled round or oval berry with a smooth skin. The colour of the berry may be green, white, red, yellow, amber and black, or a blending of two or more of these colours according to the variety. The fruit should enclose five small heart or pear-shaped stones, but as a rule it seldom contains more than three seeds. The size and consistency of the grape vary much according to circumstances.

2. History.—The age to which the vine will attain is very great. It is supposed to equal, if not surpass, the oak in point of longevity. Vineyards have been known to flourish for hundreds of years, and the vine is said to have been cultivated from the time of Noah. The native country of the vine is considered to be Persia or the South of Asia Minor. From there it passed into Egypt, Greece and Sicily: from Sicily to Italy, Spain and France. It was probably introduced to England by Roman Catholic Monks or Fathers in the third century. To Ceylon and to Jaffna in particular where it thrives so well, it must have also been introduced by them during the rule of the Portuguese. Even at the present day some of the Roman Catholic Fathers are found to be expert in Viticulture. As an instance of this, I quote as follows from "Notes from a Traveller's Diary," on page 22 of the last September number of this Magazine, where the writer speaking of Father Assauw's garden at Wahakotte says:—"What struck me most was a robust grape vine, which had been grown experimentally, laden with fruit. * * * Father Assauw, encouraged by his success, is about to extend his vineyard."

3. VARIETIES.—The varieties of the vine are very numerous, partly from its antiquity, partly from the influence of climates and soils in changing the qualities of grapes, and partly from new sorts being procured from seed by cross-fertilisation. Horticulturists base their classification of grape-vines on the character of the stems, shoots, leaves, flowers, bunches or berries. Clemente, a Spanish writer, describes 120 varieties, comprising them in two sections, downy and smooth-leaved. The Hamburgh and Muscat or Alexandria varieties are among the best.

E. T. HOOLE.

Haputale, 23rd Jan. 1891.

(To be continued.)

NEWS FROM OLD BOYS.

Mr. H. D. Juanis writes:—

Nildandahinna, a village of Walapane, contains only about thirty dwelling-houses, and is forty miles distant from Kandy. The inhabitants who are a very poor and ignorant lot, depend chiefly on kurakkan and Indian corn cultivation. The soil is rich, and is generally of a clay-loam nature. Paddy-fields occupy many of the hillsides, and are laid out in terraces which are irrigated by streams from above: these fields, however, are not very profitable. This month (February) is the sowing time for the maha crop, the weather being now, as it was last month, very wet. The rains extend from December to April. During the latter part of last year I visited a place known as Lemesuriergama in Uda-Hewaheta, and prepared nurseries and land for tea, coffee, cotton, arecanuts and paddy, and supervised the laying down of land under grass. The transplanting of the paddy ought to be done now, but is being delayed for want of water, which is a great drawback in that part of the country. The work of cutting a canal from Bodi-ela has been suspended for a time owing to washing away of a part of the excavation by heavy rain a little time ago. The Nildandahinna experimental gardens, known before as the Relief Gardens, Walapane, were originally planted with different varieties of cotton, castor-oil, tobacco and grass. Now they contain dhall, arrowroot, sweet potatoes, betel, yams and native vegetables, and I am preparing more land for sugarcane, tea, &c. I am intending to plant some breadfruit trees which I have applied for. I put down ¾ seer paddy in a nursery last month, and the seedlings will be shortly transplanted into a field which is being prepared for them at present.

The Assistant Government Agent, Nuwara Eliya, is making a noble effort to improve the condition and prospects of the unfortunate inhabitants of this district.

Mr. William Abeysuriya writes:—

Since my arrival in Weligama I have been engaged in cleaning land for tea, sugarcane and dhall. In some parts of my property Indian corn thrives well. In this district citronella is largely grown, and I intended planting up a portion of my land with it. Paddy cultivation is carried on with success though under the old system: and I am trying to introduce the new system of cultivation.

GENERAL ITEMS.

Prof. Wallace has for some time been adopting the plan of delivering a course of about thirty lectures on Agriculture to a batch rural of schoolmasters every year, so as to better equip them for the work of teaching agricultural science in the schools of the county districts.

Any housekeeper, according to the *Journal of Health*, ought to be able to detect the adulteration of milk without trouble. Let her take a long slender bottle, cleanse it well, and let it dry out. If then it is filled with milk and allowed to stand in a cool place for forty-eight hours, all the foreign fluid will be precipitated, that is, it will settle to the bottom of the bottle. The soured milk will then fill the middle of the bottle, and the fatty substance will be found floating on the top. Sometimes the top will be a layer of cream, then will come a layer of albumen, another artificial device to make the milk look rich; then will come the soured milk, and at the bottom will come the foreign water. The whole scheme of deception can be read at a glance, and though this sort of work is not scientifically satisfactory, it will always bring out the fundamental fact—whether or not the milk is normal.

The story told of Lord Hopetoun's housekeeper, announcing on his arrival after absence from home, that his emu had laid an egg, and that as his lordship was away she (the housekeeper) had put it under the biggest goose she could find, is matched by that told of Lord Rosebery to whom a county schoolmaster who was seeking patronage for a literary work, wrote asking permission to make mention of his lordship's name in his pamphlet on "insect pests."

Two Doctors of Nantes claim to have discovered another cure for tuberculosis, and base their method on the well-known fact that goats are incapable of being infected with tuberculosis. The theory of these Doctors is that inasmuch as the blood of goats must possess prophylactic properties which protect them against tubercular disease, the transfusion of the blood of those animals into that of human or animal sufferers from tuberculosis must give to the latter power to resist the attack of the malady.

Mr. R. Hedger-Wallace, late of Edinburgh and Glasgow, and a student of Prof. Wallace of the University of Edinburgh, has, we learn from an Australian paper, been making a lecturing tour through Victoria and Tasmania.

The second year students at the School of Agriculture include Johannes, Dias, Vairamuttu, Perera, Salgado, Amarawickrama, and Dias Bandaranayake.

The following are the new boys admitted in January:—Dias, Ayaturai, Fernando, Nallatamby, Athapathu, Kehelpannela, Abeyesekere, Banda, Savarimuttu, Kumarasinghe, Alwis, Gunewardene, Romail, Perera, and Thiedman—the last three being day scholars.

At a meeting of the Agricultural Improvement Society held in the School Reading-room, Mr. E. M. Johannes read an interesting paper on "The Fruit-trees of Ceylon."

Among the visitors at the school last month were Rev. Dr. Sheshadri, and his son Mr. Sheshadri, M.R.A.C., a distinguished agricultural student. The two gentlemen were on their way from Bombay to Japan, and intend doing a trip round the world.

Received with thanks for the School Museum, 2 fossil shells (gasteropods) and a head carved in limestone, both from India, the gift of L. E. Blazé, Esq.

Acknowledged with thanks, St. Thomas's College and Richmond College Magazines. The former has just entered on its eighteenth year.

Erratum—In January number: in first article, line three, for *south* read *youth*.